

COMPUTERWORLD

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Cobol, Fortran Lead System/3 Enhancements

By the CW Technical Staff

WHITE PLAINS, N.Y. — The addition of two programming languages and three hardware options to the IBM System/3 Model 10 will change this system from a small-scale replacement for tabulating equipment to a full-fledged general-purpose computer.

Most of the enhancements will not be available until next year.

The new Cobol and Fortran compilers will allow the S/3 to be considered by users who previously had to go to the 360/30 or non-IBM systems such as NCR's Century 50 or Univac's 9200 for language compatibility. An increased memory capacity, new disk device and the availability of the 1403 printer will enable the Model 10 to be offered to a much broader range of users.

The additions include a new magnetic disk system, the

5445, which brings larger-scale random access capability to the S/3. The new drives must be used in conjunction with at least one of the earlier S/3 5444 drives.

The newer drive makes use of the 2316 disk pack, used on the 2314, but with a reduced capacity per pack (20.48 Mbytes vs. 29.17 Mbytes). Two 5445 drives can be attached together with two 5444s giving a system capacity of 50.79 Mbytes. The average access time of 60 msec is comparable to that of the IBM 2314.

IBM has also announced two faster versions of its 5444 drive, providing an average time of 86 msec for the 2.45 Mbyte model and 126 msec for the 4.8 Mbyte model.

The addition of the 1403 printer in two models offers increases of 200% and nearly 400% over the former maximum available with the S/3. Rated at 600 line/min and 1,100 line/min, the printers are used with a

new 5421 control unit to replace the 5203 printer.

The memory size range of the S/3 has been expanded with the addition of a 48K size, in addition to the earlier 8K, 12K, 16K, 24K and 32K models.

The enhanced S/3 cannot fill the gap to the 360/30 exactly, since it still lacks magnetic tape handling capability. But this could be offset by its much lower price.

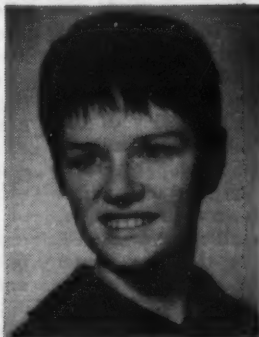
From the software standpoint, the addition of an ANS Cobol subset and Fortran IV for program development will give S/3 users programming capabilities comparable to most major systems.

Now the S/3 user will no longer be tied to the special RPG-II or the Basic Assembler Language, which have limited program transferability and have been considered

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Robert Patterson



Kate Rachstein



Joseph Hanlon

First Win for DP Writers

Privacy Series Honored

NEW YORK — The significance of threats to personal privacy posed by computerized data banks were emphasized on two fronts last week, as congressional hearings opened in Washington and three *Computerworld* writers were given journalism awards for editorials on the subject.

The chief contributors to last year's CW series, and the award recipients, are Robert M. Patterson, the newspaper's executive editor; Kate Rachstein, former education editor, and Joseph F. Hanlon, staff writer. The awards will be presented at the Winter Conference of the American Business Press (ABP) here next week.

These 17th annual Jesse H. Neal awards for the best series of editorials mark the first time writers for a computer publication have been so honored, according to an ABP official.

The "editorial achievement awards" are made in five categories, including feature

articles, special issues and development of material. Each category is divided into three classes, based on size of publications. CW falls into the largest-size class.

News coverage and editorials are continuing parts of CW's normal in-depth examination of computer issues, as they relate to the computer community and the general public.

Full news coverage of the data bank threat alerted the industry to the gravity of the situation, and in recent months industry leaders have spoken out on the subject, congressional leaders have introduced bills to protect privacy, the Army has at least partially destroyed its computerized citizen-spying apparatus, and the issue is one of the most-discussed in both technical and social circles.

"The editorials represent only part of a CW campaign to keep readers informed of social problems created by computers," Patterson said.

"They would not have been possible without the information resulting from research by every member of the editorial staff. For instance, Mrs. Rachstein's contributions to the series were a byproduct of education stories she was working on."

Fairly early in the campaign, one editorial enunciated the essence of the triple-threat of computerized data banks:

The data may be used for improper purposes; the data may be processed in such a way as to mislead the recipient; and erroneous data may be accepted at face value by the recipient "because computers are never wrong" [Jan. 21, 1970].

Shortly thereafter, a news item and consequent editorial highlighted the sale

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Data Bank Hearings Open To Call for Control Agency

By Alan Drattell

CW Washington Bureau

WASHINGTON, D.C. — A call for regulatory control to protect the privacy of individual citizens came last week in the opening testimony before the Senate Subcommittee on Constitutional Rights.

Sen. Sam J. Ervin (D-N.C.) is conducting three weeks of hearings on "Computers, Data Banks and the Bill of Rights."

Taking issue with the call for regulation, the committee's ranking Republican, Sen. Roman L. Hruska (R-Neb.), said that data banks were nothing new and proposed regulatory agencies are "super police."

Improper Screening

In his opening remarks, Ervin said that many Americans "are concerned about the growth of government and private records on individuals" and are worried "that this information is being automated or computerized without proper screening or control."

He also referred to the threat to the individual of mechanical breakdowns of computers and to the stealing of personal records "because of the access and taping afforded by improperly guarded" systems.

The feeding of inaccurate data into government and private information systems is only part of the concern. "More important," Ervin added, "is that the increased use of government and private computer-based systems is making it vastly more economical to acquire and store information about people for reasons which should give us serious pause."

"It is creating not only an army of specialists in the information processing field, but battalions of investigators and analysts specializing in feeding the zeal of statistics collectors in government who claim they need information for research, and who back their requests for data with the sanctions of criminal and civil law."

The existence of all these files, he said, could serve to intimidate many Americans. "When people fear surveillance, whether it exists or not, when they grow afraid to speak their minds and hearts freely to their government or to anyone else, then we shall cease to be a free society."

Ervin, putting the privacy issue into perspective, said: "If Americans can harness computers to get to the moon, surely we can harness them to preserve our liberty."

Lead-off witness Arthur Miller, University of Michigan law professor, agreed with Ervin. "It is not that important that dossiers... repress people; if they give the appearance of repressing people that's dangerous enough. We have to generate... sensitivity to information."

Miller called for an "information ombudsman" patterned after the federal General Accounting Office "that can operate under a set of legislative guidelines and establish a policy for the protection of individual privacy... and rights and the preservation of constitutional rights."

Opposition

Hruska, however, took issue with Miller. He said that the professor was not recit-

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University Centers Face NSF Cut Off Of Research Funds

By Phyllis Huggins

CW West Coast Bureau

LOS ANGELES — University computer centers are in deep financial trouble, and according to the National Science Foundation (NSF), the first one to close will be California Institute of Technology's center. Cal-Tech, with a total overhead cost of \$3 million for its computer center, is expected to run a \$1.5 million deficit this year.

Dr. John Pasta, director of computer activities for the NSF, acknowledged that NSF is cutting off categorical grants for support to computer centers.

"We helped computer centers in universities get started. It was understood that after two or three years they would have to be self-supporting. Research funds for this effort have been cut off."

Institutional funds, as such, are not being supported by the President, Pasta noted, and acknowledged that while this

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GE and RCA Reveal Solid-State Devices for Displays, Memories

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Need for Regulation Disputed at Congress Hearings

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ing anything new, indicating that when printing, newspapers, radio and TV appeared people were concerned about their effects on privacy. "This is a situation we have lived with for centuries," he added.

The senator asked if it would not be better to devote efforts to how "we can make information gathered useful, necessary, dependable and complete... and how we can separate that which is harmful and set up some means of control" rather than "ridiculing."

Miller said that there were "no effective restraints on government information gathering."

Hruska answered: "We do have, in my judgment. There are effective restraints."

"Effectiveness lies in the eyes of the beholder," countered Miller. "And also ineffectiveness," replied Hruska.

Miller said he didn't think faithful reliance on federal employees was wise. What Congress is obliged to do is to "harmonize... lay down new legis-

lative guidelines for confidentiality... put a neutral third office into the Federal Government..."

"Sort of a super police," responded Hruska.

"An information ombudsman," said Miller.

Rep. Edward I. Koch (D-N.Y.) told the subcommittee that he had introduced bills in the House of Representatives which would establish a system to act as a check on the government's recordkeeping.

The bills would require that each government agency which maintains records concerning any individuals and also the House Internal Security Committee notify the individual that such a record exists; notify him of all transfers of such information; disclose data from such records only with the consent of the individual or when legally required; maintain a record of all persons inspecting such records; and permit the individual to inspect his records, make copies of them and supplement them.

Dr. Jerry M. Rosenberg, a management consultant and practicing psychotherapist, who like Miller is author of a book on privacy, advocated the establishment of a nonprofit, private organization to help protect an individual's rights to privacy. He said the group could be called "The Institute for The Responsible Use of Technology."

'Social Bankruptcy'

Bert Neuborne of the New York Civil Liberties Union proposed "social bankruptcy," which he described as being comparable to economic bankruptcy, as "a way to wipe the slate clean." This would enable an individual to obtain a court order to purge all of his past records and start again.

The subcommittee's chief counsel and staff director, Lawrence M. Baskir, told CW that Ervin plans to introduce a bill in the Senate following the hearings.

He said he could not be specific about the timing of the bill and he had no idea what form the legislation would take because "there's so much there," referring to the testimony being presented before the subcommittee.

The second day of the hearings spotlighted military surveillance of civilian political activity and

what happens to the data that is collected.

A number of ex-Army intelligence agents testified as did Rep. Abner J. Mikva (D-Ill.) who called for Congress to ban "all domestic surveillance by the military."

Ervin reminded hearing participants and attendees that "one of the first computerized information gathering programs reported to the subcommittee was the Army intelligence computer at Ft. Holabird (Md.). This machine was being fed data collected from surveillance and note-taking on civilians active in politics and on matters of government policy."

The U.S. "today possesses the intelligence apparatus of a police state... it exists today as a loose coalition of federal, state, municipal and military agencies," according to testimony by

Christopher H. Pyle, the former Army intelligence captain who last year revealed the existence of the Army's civilian spy network in an article in the *Washington Monthly* magazine.

Secret Service

Pyle said that the Secret Service "has developed one of the most versatile - and constitutionally offensive - political data systems in the government. Built around a Honeywell 2200 computer, this system is capable of sorting and retrieving by name, alias, method of operation, affiliation and physical appearance."

The third day of the hearing Sen. Birch Bayh (D-Ind.), a member of the subcommittee, said that he was introducing a bill that day called the Citizen's Privacy Act - the Senate version

of Rep. Koch's bill introduced earlier in the House.

In a statement inserted in the official hearing records Bayh said: "I do not think that anyone in this room approves of the collection of data - whether by the government or by private interests - merely to harass, or to keep tabs on those who would dissent peacefully. 'We know, on the other hand, that as government and industry grow larger and try to offer more services, it is essential that they be able to collect and use immense amounts of information, just to do their jobs effectively. But, on the other hand, we all know that guidelines must be created to prevent the misuse of this new technology, technology which endangers our constitutional rights of privacy, freedom of speech and freedom of assembly."

NSF to Cut Off Research Funds to Centers

(Continued from Page 1)

move is coming sooner than some centers had anticipated, the centers should be supported by the users.

"Somehow or other we have failed," said Pasta. "The users are not buying computer time. Computers have been oversold. You don't need a 360/75 to sort or punch cards. You can get a cheaper unit for that."

"With university funds tight all around, potential users are just finding other ways of getting something done. Some have gone to small individual computers. This has affected the large centers and is causing lots of problems," he continued.

Small Computers

"The advent of the small computer is helping push out the large computers. Why should NSF give grants to new facilities or to upgrade present ones when they can't pay for what they've got? It's very sad and we are quite concerned."

Even if the policy in regard to research funds for university centers had not been changed, there is little that NSF could do. The total budget for this year for computer-related activities is \$17.5 million, which is divided three ways. Computer science is allotted \$5 million, which is

largely grants to individuals.

Computer innovations as an educational tool received another \$5 million. The rest goes for worthwhile applications.

The computer center at Ohio State University is one of the more fortunate ones, receiving two-thirds of its support from the university. The university's philosophy, according to Dr. Roy Reeves, director of the DP center, holds that the center should be supported by the uni-

versity, as well as by users.

IBM has been, along with NSF, a prime supporter of generalized development of such centers.

"The objective of IBM educational grants program is to help support and strengthen higher education through selective grants to institutions and associations. A substantial portion of this program consists of unrestricted grants made directly to many different colleges and universities," IBM said.

Series on Data Banks Honored, DP Writers Receive First Award

(Continued from Page 1)

of a data bank on three million government employees, which could offer a list by type of employment, agency, sex, supervisory position or "a number of other parameters" [March 15, 1970].

The latter editorial pointed out "how publicly available records, once computerized, can be manipulated to produce data on any selected group or people."

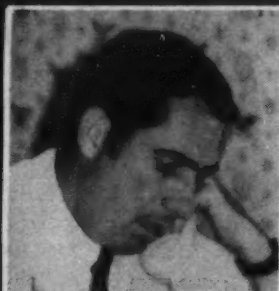
The piece admitted the information was already available to the public, "but the ability to retrieve selected information at any reasonable cost was not. Now it is possible."

Through continuing technical, as well as social, research into

computing, the users of the technology will continue to be informed "not only about the rapid advances in the field but about the problems these advances create," Patterson noted.

The Neal award is the first public recognition the CW staff has received for editorial achievement since CW's inception in the summer of 1967. It was also the newspaper's first attempt at winning this award, which ABP has called the "Pulitzer Prize" of the specialized business press field.

There were 366 total entries, including 46 in direct competition with CW in the "best editorial" category for large publications.



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IBM Exhibit Review

Here's a Course in DP History

By E. Drake Lundell Jr.

CW Computer Industry Editor

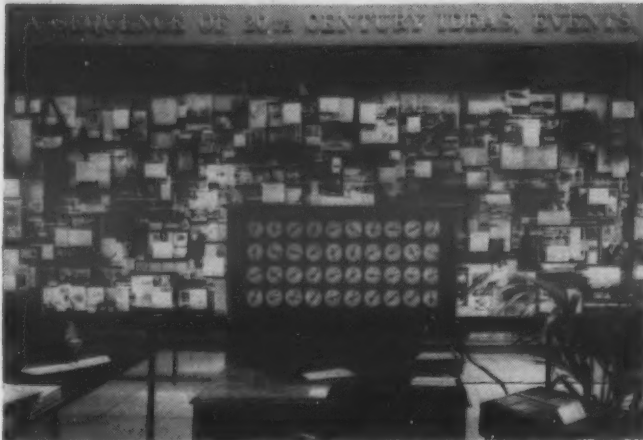
NEW YORK — Like any great collage, IBM's present computer perspective exhibit here presents a unified whole through the mingling of divergent bits and scraps — in this case a unified and powerful portrait of the forces that led to the first commercial computers.

The entire exhibit consists of a "history wall" which traces the streams that were to lead to the computer between 1890 and 1950; a multimedia presentation of present computer applications; and computer terminals that allow visitors to play "Twenty Questions."

The interactive part of the program seems a bit basic — not really indicative of the power of the machines — but it did attract a favorable reaction from other attendees. At the same time, the multimedia slide and film presentation is interesting and, to the general public, informative.

Major Attraction

But the major attraction is the 48-foot history wall — a brilliant piece of collage conceived by the office of Charles Eames with



Census machines from 1890, foreground, highlight computer history exhibition. In the background is a 48-foot glass-enclosed, three-dimensional history wall holding artifacts and related items leading to the present generation of modern electronic computing systems.

historical input from Professor I. Bernard Cohen of the Harvard Department of the History of Science.

The wall, after paying brief homage to Babbage's Analytical Engine, traces the development of the computer from 1890 when Herman Hollerith's tabulating machine was first used for the U.S. census. (Incidentally, a working model of one of the machines is also on display — fascinating.)

3 Themes

The three main themes that contributed to the computer — logical automata that use information from past performance

to chart future action like the ball governor; statistical machines; and calculating machines — are all traced on the wall.

The wall is made up of mechanical artifacts such as early accounting machine parts, gyroscopic stabilizers, early collators, a plug-in unit from Eniac, and ends with the iron tapes used on the first Univac.

One has to agree with IBM that the display at 590 Madison Ave. is truly "an exhibition of the old and the new, juxtaposed so that each may alternately become background and foreground for a fresh view of the role of the computer in the 20th century."

System/3 Enhancements Led by Cobol and Fortran

(Continued from Page 1)

drawbacks by users attempting to attract qualified programmers.

With the new compilers, programs developed on other CPUs could be compatible with S/3 with minimal transfer problems.

The S/3 Cobol program product will be available in the second quarter of 1972 at a license fee of \$75/mo. Minimum main memory will be 16K bytes.

The Fortran IV compiler will be licensed at \$100/mo and will be available in the third quarter of 1972. A minimum of 12K bytes will be required.

By contrast, ANS Cobol for DOS/360 is available for a \$55/mo license and requires 64K of core. Fortran IV, under DOS/360, uses 40K of core and is licensed at \$50/mo.

Prices and Availability

Monthly rental for the 5445 disk drive is \$885 for the single drive configuration and \$1,235 for the dual. Purchase prices are \$37,475 and \$53,150 respectively. Initial customer shipments are scheduled for the second quarter of 1972. Rental for the faster version of the 5444 ranges from \$220 to \$685, depending on the configuration. Purchase prices range from \$9,430 to \$25,465. First customer deliveries are scheduled for December.

Monthly rental of the S/3

Model 10 central processor with 49,152 bytes of main memory will be \$1,285 for the card system and \$1,410 for the disk system. Purchase prices are \$54,600 and \$60,725. First customer deliveries are scheduled for December 1971.

The 1,100 line/min 1403 printer with the required 5421 controller will rent for \$1,407/mo with a purchase price of \$61,995. A 600 line/min version will rent for \$1,130 with a purchase price of \$51,600. Initial customer deliveries are scheduled for the first quarter of 1972.

Music Needs 'Humanizing'

PALO ALTO, Calif. — Stanford University professor Leland Smith has devised a method to "humanize" music produced by a computer. He said that music played in perfect rhythm, such as that performed by a computer, is less pleasing to the human ear, which is accustomed to hearing variations.

Smith uses a pair of telegraph keys to produce these variations in the music.

Forms Guide DP Printers

SHELBY, Ohio — DP printing operations may find useful a free form legibility guide from GAF Corp. that contains a list of computer form paper and carbon thickness as a set-up aid.

News Wrapup

DP Spots Excessive Medical Fees

SACRAMENTO, Calif. — Computers are being used here to detect irregularities in charges for medical services and for nursing home calls.

One of the latest policing efforts pinpoints excessive charges filed by doctors for California Medicare and Medicaid services.

The Government Accounting Office (GAO) has accused the California Blue Shield Insurance Co. and the Department of Health, Education and Welfare of overpaying by \$426,000 in 1969 for nursing home calls.

The discrepancies occur largely in such cases as doctors making calls at a nursing home and charging full fees for each person seen. In one case, a doctor using a portable X-ray machine charged \$24 for each of 35 patients X-rayed in one visit.

The computer has been programmed to spot any conspicuously large charges or any particularly large number of calls in one visit at a nursing home.

Jamaican Firm Awarded N.Y. Contract

NEW YORK — Despite protests from a local bidder the city has finally decided to award a computer contract for \$291,488 to a company operating out of Jamaica, B.W.I.

Since the bids for the keypunch work involved with rent control data were opened last October, city officials have avoided giving the contract to Volt Information Sciences, the West Indian firm and low bidder.

When it was revealed that Volt had underbid by \$338,489 the lowest city-based company, company officials protested to Mayor John Lindsay.

It was pointed out to the mayor that Jamaican workers make 39 cents an hour. The city has switched its position on making the award to Volt several times since October.

Bill Would Control Motor Vehicle Data Bank

SACRAMENTO, Calif. — Once again a bill is before the California Legislature to put citizen controls on the output of computer data used by the Department of Motor Vehicles and its data bank. Present practice is to sell the list and the personal information to any one that asks and pays the price.

The bill, introduced by assemblyman William Campbell (R-La Puente) contends that this is personal information which should not be sold without prior consent of the person involved and, furthermore, each individual should have knowledge of who has access to the data kept on him.

Although the same bill was filed last year and killed, Campbell said that the growing use of this data bank as a commodity, without even the accuracy of the information being verified, is intolerable.

His bill would prohibit the bulk sale, dissemination or inspection of the files to anyone but governmental agencies. It would also ban the public inspection, sale or dissemination of any individual's record data except with that person's approval. And the bill would permit individuals to inspect their own records to ascertain accuracy of data.

'Agency' Collects Bills Previously Paid

LANSING, Mich. — A fraudulent scheme uses a "computerized collection agency" to send out letters to former customers who have paid for actual orders placed about a year previously.

The operation is spread across the country and involves only small amounts of money. Even though the bill was previously paid, the scheme has a good chance of success since the victim may be unable to find proof of payment. Also, many persons would prefer to pay again rather than protest when this would involve battling a computer over a small amount of money and might jeopardize their credit rating.

The form allows only six days in which to pay or to produce evidence of prior payment before collection action will be started.

Jobless Scientists Turn to Boston Center

BOSTON — The estimated total of 10,000 jobless engineers, scientists and supporting professional workers in Massachusetts may find renewed hope for employment in the 128 Professional Service Center.

The national pilot project, operated by the Massachusetts Division of Employment Security, is centered around a computer that can locate nuclear or environmental engineers or a man who helped devise the guidance system for Apollo 14.

During its first two weeks of operation the center has had job applications from more than 1,500 such men. Some are PhDs; some have more than 25 years of experience in engineering research, and some have been out of work nearly two years.

Wait Another Month—They May Do It Free!

PALM BEACH, Fla. — The stubborn user who plays hard to get may soon reap the rewards.

At least that's what the local county commissioners discovered when they decided to wait before seriously considering the offer of a firm to implement a DP program for the sheriff's office.

Less than a month ago, System Science Development Corp. said it could do the job for \$650,000, but there were no takers. Now the company says it can do the same job for \$90,000 by modeling the program after one already in existence.

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Installation was completed on Friday, January 29. And Zayre immediately put the Model 155 to work on inventory, billing, sales, and accounting without altering their existing System/360 programs.

Zayre's computer professionals say the Model 155 is everything they expected and more.

It's already processing their work 2.5 times faster than the System/360 Model 50.

In its first week the new system prepared reports on sales from 200 stores in 70 cities and tracked a 5-million-item inventory.

Among other things, it also prepared 20,000 payroll checks. Payments for 30,000 vendors' invoices. Accounting and statistical reports for management. And processed information from 3,000 cash registers.

Zayre will use IBM's powerful Operating System (OS), which permits the Model 155 to perform up to 15 different jobs simultaneously.

Last month nine other businesses got the speed and economy of Model 155.

A merchandiser will use it to process orders and inventory control information up to four times faster.

A manufacturer will use it to help put plant-floor production on-line.

A banker will use it to handle a growing number of accounts.

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Government Union Suddenly Finds 1,283 Members

By a CW Staff Writer

WASHINGTON, D.C. — Cool heads and good news reporting lent a refreshing note to a computer-type error which recently caused almost 1,300 legislators and journalists to receive free membership cards to a government employees' union.

The "good reporting" is credited to the general press, to newspapers like the *Los Angeles Times*, which preceded its headline with the notation "Human Error," then continued, "Union Ranks Given Boost by Computer."

The recipients of the free membership cards were on the complimentary mailing list for the newspaper of the American Federation of State, County and Municipal Employees (AFSCME).

The error was easy enough to identify: a computer operator failed to pick up and use a parameter card eliminating the complimentary portion of the circulation list used for bulk mailing of the cards, so 1,283

congressmen, reporters, editors and members of other unions received the free cards.

Correcting the mistake was another story, since "thank you" letters began pouring into the AFSCME headquarters here shortly after the 1971 cards were mailed to the new "members." Furthermore, some complaints were sent by government officials not permitted to belong to this type of union because of conflict of interest or their high management level.

Computer Letter Explains

Federation officials were a little bewildered at first, then devised a "computer letter" to explain the problem and recall the cards, some of which had already been returned with complaints.

In the letter, the computer explained, "My performance is entirely dependent on which button gets pushed. Early this month someone pushed the wrong button."

While technically a little off

base, the letter served to brief the extra recipients that something human indeed went wrong.

The letter continued, "The next step in my program would have been to send you a bill for union dues."

To close with a note of levity, the computer added, "The guy

who pushes the buttons reprogrammed the whole thing and scheduled this letter of explanation and apology" instead of "enriching the AFSCME and setting the stage for an increase in my retainer."

Union officials told CW this approach "seemed to pacify"

the extra recipients, some of whom requested they be able to keep the cards as mementos.

There are 500,000 members in the union, which uses a computer service bureau for membership and circulation lists, among other applications.

Clearinghouse of Research Information Closes Scientist Communication Gap

WASHINGTON, D.C. — It's an old story: two scientists, working in different locations, come up with almost identical results, and almost at the same time. Nice for the storybooks. But, in terms of human and financial resources, extremely wasteful.

At the Science Information Exchange, part of the Smithsonian Institution, a computer is helping insure that such unwarranted duplication doesn't happen very often. It's also helping manage a significant part of the \$4 billion the U.S. spends each year on basic research.

"Two scientists can work on the same general problem," said Dr. David F. Hersey, deputy director of the SIE, "since they may come up with equally viable solutions. But in today's fast-paced world, a scientist has to know what others are doing so that he doesn't waste countless hours and valuable research funds."

The SIE helps overcome this communications gap by operating a clearinghouse of information on research in progress. This includes about 90% of federally funded, non-classified research, as well as thousands of projects funded by private sources.

The information addresses the "who," "what," "where," and "how," of a study, along with the agency or other group sponsoring the work.

Basic information comes from scientists working on projects. Descriptions they supply are

carefully examined by scientists and engineers on the staff of SIE, analyzed and indexed. Terse summaries, limited to 200 words, are then stored in the electronic files of the SIE's computer, an IBM 360/40.

Requests for information are processed by SIE staff members with the same kind of handcrafting that went into the indexing. These requests come from people deeply involved in research as well as from people with general interest in a subject.

A scientist might want, for example, a summary of all cancer research projects underway. He could also get a more detailed analysis in such areas as cancer virology, cancer chemotherapy or cancer radiology. A

further search could tell him the agencies working in these areas, as well as the names of individual researchers.

The information in the SIE system covers the life of a project from the time it is first funded or undertaken to the time when literature resulting from it begins to appear.

When a research informs the SIE that his work is completed, the project is removed from the computer's files.

Records of such projects are recorded, generally on microfilm, and retrieved when needed. This historical file, which contains information not always available in published reports, provides a record of on-going projects going back 20 years.

Data Bank of Students Proposes To Facilitate Ethnic Integration

By a CW Staff Writer

SAN FRANCISCO — All pupils in the San Francisco school system will be listed in a computer data bank as part of an effort to set up an integration plan. School officials hope to integrate not only ethnically, but socioeconomically as well.

Information in the data bank will only be available to school officials, according to Leonard Hanlock, manager of data processing for the San Francisco Board of Education.

The data bank will contain each student's name, address, sex, birth date, grade, school, and a special ethnic code for white, black, Chinese, Korean, Filipino, American Indian, Spanish speaking and other.

Hanlock noted that although

the data bank is being set up to facilitate integration, it will be used for other school administration purposes as well. Additional information, such as data on the student's achievement in school, will be added later.

Socioeconomic data, such as income, will not be collected for each student. Rather, according to Hanlock, a separate file will be set up with average data for city block or census tracts.

But it will be possible to get a printout containing specific information about the student plus approximate socioeconomic data. This information will not be released to non-school personnel such as prospective employers.

The data bank is on a 360/50.

A 46-member citizens committee is now attempting to determine the exact criteria for the desegregation plan.

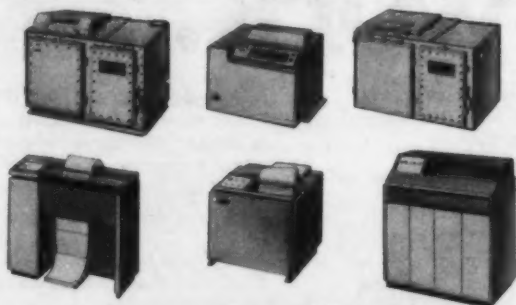
Initial cost of the project is estimated at \$77,500.

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Electronic Memories unobtrusively mentions the development of its 7.3 million bits-per-module Megamemory 1000; very compact, but a little too large to be unobtrusive.

Speaking gently about this little monster is a little like talking baby talk to a five hundred pound gorilla. (Actually, maximum weight is only 350 lbs.). But its speed belies its bulk: full cycle time of 1.5 microseconds and access time of 850 nanoseconds. You get a wide range of storage capacities—from 32K by 160 to 524K by 14. It's definitely a compact monster. A patented drive/sense scheme eliminates several switches normally associated with 2 wire 2 1/2D design. This straight-forward, practical design approach enhances reliability and breaks through price barriers that have always restricted core memory use in large-scale storage applications. As an add-on memory, Megamemory 1000 has been designed for interface with virtually any

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("Did we tell them to call it Supercore or Epicore?")

Editorial

Ounce of Prevention

The Gulf Oil Company recently converted to a new computerized retail billing system.

At the same time, Gulf Vice-President E.F. Jacobs sent a letter to Gulf credit card customers advising them of the change and noting that no problems were expected.

"However, we are aware that the possibility for mishandling does exist during a transition," he wrote. "For that reason, we have set up a special office to handle any account inquiries that may be caused by the move."

The letter then gave the name and address of the person in charge of this new office and also gave a telephone number that could be called between 8 a.m. and 10 p.m. seven days a week in case of emergency.

Such forethought helps to head off serious problems with complaints and improve the reputation of computers.



'Ah - Jee, to Boost Our DP School Affiliate's Placement Rate, Your Programming Department Is Being Replaced by the Class of '71'

Letters to the Editor

Wonderful 'Old Gal' Univac 1 Deserves Even More Credit

As usual when I read articles about Univac 1, I am touched by nostalgia. The wet nurse during my first five years of computer training and programming (1953-1958) was that wonderful "old gal," Univac 1, at the then Remington Rand New York City data center on 24th St. and Fourth Ave.

I agree with, and, at the same time, am hurt by the reality of Petersen's article [CW, Feb. 10] that many of the Univac 1 features have been, in recent years, passed off as new techniques and new concepts without giving credit to grandparent Univac 1.

For the more recent computer programmers and technicians, I feel that a heritage has been lost to the extent that I am thinking about giving a course in computer history.

I would like to point out some additional features not stressed in the article.

- I/O buffering of magnetic tape data was a hardware feature that allowed I/O overlap as the buffers were being filled or emptied. The buffers were not part of memory but, rather, separate synchronizer storages integrated into the main-frame.

- The magnetic tapes were capable of being read forward and backward, saving a significant amount of rewind time, especially in large sorts.

- Since magnetic tape was the only mass data medium available to the computer, there also existed off-line card-to-tape and tape-to-card units. As rudimentary as they were, they also did not handicap the computer by restricting internal speeds to the relatively slow pace of card reading and punching.

- In comparison to today's large memory machines with a full range of operating systems, compilers, assemblers, etc., one wonders how the many (I couldn't even guess the number) involved and constructive application programs were ever written in machine language with practically no software support and within the frame of a 1,000 twelve-character word memory.

Marvin Goldstein
Senior Vice-President

Astradyne Computer Industries Inc.
New York, N.Y.

Revival of Features Urged

In reference to the article on advanced features of the old Univacs [CW, Feb. 10], there are two other features that could usefully be revived these days.

The Univac UFC series character set included one, called "ignore," that compared equal to every other character - thus avoiding the need for bit-sifting when comparing non-contiguous parts of words against a constant. Another feature of the

UFC was an internal switch which, when set by the programmer, caused zeroes and blanks to compare equal.

On the debit side, the particular system I worked with had two "high"-speed card reader/punches - so one would usually be up!

T.D.C. Kuch

Bethesda, Md.

Eye Fatigue Factor Overplayed?

Your Letters to the Editor column in the Feb. 10 issue contained a request for information regarding fatigue factor for CRT operators. Oklahoma Blue Cross and Blue Shield has been using CRT terminals for input and query for approximately three years.

Our work measurements department has established standards for all CRT inputting functions. Our studies have not shown eye fatigue to be a significant factor in the production efforts of the operators. Our work day is 7-1/2 hours on the job, and our CRT screen color is white on green.

Gene Ross
Systems-Department Manager

Oklahoma Blue Cross & Blue Shield
Tulsa, Okla. 74102

Advertisement Criticized

I strongly object to *Computerworld's* acceptance of an advertisement from the University of Witwatersand, Johannesburg, South Africa. The fact that this employment "opportunity" was probably not available to all of your readers should have been sufficient reason not to accept the ad. In addition, the racial policies of the Republic of South Africa should have morally obligated *Computerworld* to refuse the advertisement.

Richard R. Moore

East Lansing, Mich.

On the other hand, some of our readers are currently unemployed and having trouble getting new jobs. They should not be denied information on opportunities. Ed.

PDP-10 Is Hardly a Mini

The headline, "Mini Has Many Projects," on Page 26 of the Feb. 10 issue is somewhat inaccurate.

As leader of the minicomputer industry, DEC is proud to see items in print concerning its computers, but not all DEC computers are minis.

The PDP-10 is an advanced large-scale time-sharing system, with 36-bit words and 366 instructions; hardly a mini.

Alan Kotok
Consulting Engineer
PDP-10 Engineering

Digital Equipment Corp.
Maynard, Mass.

Unemployed Find Hopes Renewed in Washington

WASHINGTON, D.C. - There are some positive activities going on in this town aimed at easing unemployment among technical people.

Sometime this month, for example, the White House will sponsor a meeting between the heads of national professional societies and the President's science adviser, Dr. Edward E. David Jr., on unemployment.

And on Capitol Hill, Congress is considering a number of bills to put technical people back to work by rechanneling their energies.

NSF Aid

Similar bills, for instance, have been introduced in both houses to enlist the aid of the National Science Foundation in putting these individuals back to work on civilian socially oriented research and development projects.

The House bill, H.R. 34, was reintroduced in this session by Reps. Robert N. Giaimo (D-Conn.) and John W. Davis (D-Ga.) for themselves and 66 cosponsors. A similar version, S. 32 in the Senate, was introduced by Sen. Edward Kennedy (D-Mass.) with 14 cosponsors. The house version has been referred to the Space and Astronautics Committee, the Senate bill to the Committee on Labor and Public Welfare.

Both bills would aim at helping solve domestic problems in such areas as health, transportation, housing, crime and pollution.

Primary Attack

"It can be viewed as a primary attack on a situation which allows highly trained individuals to be deprived of work in their

specialties, crying social needs to go unfulfilled because of a lack of trained and socially oriented specialists, and our brain trust of skilled personnel and their invaluable technology to literally decompose as government support is shunted in other directions."

The House bill includes an advisory commission of scientists, engineers, industrialists and educators to be established to help shape and guide the NSF retraining programs.

Another bill, S. 31, has been the subject of hearings before the Senate's Committee on Labor and Public Welfare. Introduced by Sen. Gaylord Nelson (D-Wis.), it is called the "Emergency Employment Act of 1971."

Citing "great unfilled public needs," this act would put people to work in environmental quality, health care, housing and neighborhood improvement, recreation, education, public safety and other socially oriented programs.

It would not only provide work for unemployed and displaced technical people, but also for the disadvantaged, returning military veterans and young people entering the labor force.

The act would help to create jobs and training programs through funds channeled to the cities and states for various projects. It would also be an ongoing program that would be triggered into action when the national unemployment rate hits at least 4-1/2% for three consecutive months in any given 12-month period.

In tone, S. 31 sounds somewhat like a 1971 version of the Works Project Administration of the New Deal days of the 1930s, but an aide to Nelson was disturbed by the comparison. He said that unfortunately when many people think of WPA, they conjure up a picture of men leaning on shovels. "That picture was untrue in regard to WPA and it certainly will be untrue of the Emergency Employment Act."

D.C. Data-Line By Alan Drattell



Ignorant and Ignored It May Be, But...

DPMA Should Be Saved Now, If It Is at All Possible

One of the most enlightening comments on the computer profession was provided recently in the Labor Department hearings as to whether or not we should be paid overtime.

A union official was arguing

that computer operators, some programmers, and systems analysts should be paid for the time that they put in, and this revolutionary idea was being opposed by the ACM, by service bureaus, and by others on a variety of remarkable grounds.

But it was the union official who really put the Data Processing Management Association (DPMA) (which did not even bother to appear at the meeting) on the spot when he happily said that if this profession had a certification examination, similar to that of the accountants, then his union's position might very well be modified.

The implication, of course, was that those people who were certified would be recognized as professionals and so enjoy the great privilege of giving their labor back to their employers during overtime period, as opposed to being paid for their time.

The tragedy, of course, is that the DPMA has been running such an examination for eight or nine years. It is called the Certificate in Data Processing, and gives the person the right to put the letters CDP after his name. There are currently many thousands of CDPs in the country but neither the union official, nor apparently the representatives of ACM, brought out this point.

This rather says that both the CDP examination, and the organization behind it, are in deep trouble. If an examination which is half as old as the industry can be just brushed aside in the way that CDP normally is, then something is very wrong.

Too Secretive

In fact, something is very wrong with the CDP. It is a far too secretive operation altogether. When the thing first came out, it was announced that the questions would not be published to start with until experience had been gained.

In running this type of examination it is normal for old sets of questions to be used as the method of training people. They are also used, with model answers, as the way of evaluating the examination and its usefulness. Somehow the questions have not been published yet, and, as I said, the CDP is now half as old as commercial data processing.

Moreover, although it is officially for certifying the competence of people who manage DP operations (as opposed to those who program computers) you cannot take it just because

you happen to be qualified by experience. You can manage an installation for 10 years, and be the best person around, but now, unless you have already taken it or, alternatively, unless you are academically and probably irrelevantly qualified in a way many DP managers are not, you cannot take it.

Too Restrictive

Other professional societies have not found this necessary. They have instead found it definitely dangerous to impose such rules. The moment such a rule is created then the value of the qualification is reduced considerably because it means that just as good people can be found outside, apparently unqualified.

The rule is defended by DPMA on the grounds that most employers prefer to employ college graduates. But if this is really true, then why do we bother about having a CDP at all?

If the only documentation the employer has in order to see whether a person is any good is whether he is a graduate of a university in anthropology or some nuclear science or something else which blatantly is irrelevant to the profession of data processing, and if this is more important than whether or not a person has got a CDP, then the CDP simply is not doing any good for the profession, is not necessary, and should be abolished.

Still Necessary

Actually, of course, the CDP is necessary. It is, even in its horribly incomplete form, an asset to the profession. It needs to be strengthened. It needs to be opened to people of experience. It needs to have its questions and model answers thrown open so that people can train properly and openly.

It needs to have its claims as a valuable qualification pushed and pressed and emphasized throughout the profession. It needs its own organization freed from the DPMA. But even if it does not get another little bit of help, and remains tied up in its maternal apron-strings, it is still a valuable asset and worth protecting.

Reflects on DPMA

But, when the DPMA has done such a horrible job in protecting its qualification program, surely that reflects on the association itself?

It certainly does. And something else that reflects on the Association was in the January issue of the *Journal of Data Management*. An article entitled "EDP Almanac" appeared that was supposed to be "the first effort in compiling the significant EDP events during the past 20 years."

It was a nice article on the surface and perhaps from some editorial points of view. It covered, for instance, five pages, which is a reasonable size. It had over 200 dates in it. This showed a reasonable amount of research. It had nice detail in it, like the fact that the first production 701 was erected in April 1953 in IBM's world headquarters, that

the Harvard Mark I project in the 1940s had been sponsored by IBM, and that particular IBM machines operated faster than earlier IBM machines.

As I said, from a superficial editorial point of view there was enough there that you could not say that there was not an article. Well, not unless you read it, and had any knowledge of the industry.

Startling Omissions

It was what was not there that startled me. For instance, the first commercial machine, Univac I, was not mentioned at all! (The March 1959 entry starting "Sperry Rand developed the Univac computer..." does not refer to Univac I... It is a misdated, misnamed reference to the first transistor machine, Univac's Solid State 90 system.)

The greatest contribution of Burroughs Corp., the B-5000, which started a software philosophy which has taken over the industry, was not mentioned. The original multiprogramming machine, the Honeywell 800, was not mentioned. And many, many other essential hardware dates — events that no one compiling a chronology should miss — we are missing. Truly it was Hamlet without the prince.

And yet this was published. Published in the journal of the DPMA. And no apology appeared in the February issue either!

So we have three recent incidents which raise questions about the situation in the DPMA. We have the ill-advised restriction of entry to the CDP, we have the fact that the CDP can be, and often is, ignored although it has a long history, and we have the fact that the association's journal can publish Hamlet without the prince.

What does it add up to? Does it matter? Should we just carry on and ignore it? Or should we just accept the fact that they are only minor problems and push everything under the rug?

I do not think that we should. And to explain why, I would like to talk a little bit about the real asset of the Data Processing Management Association — its unique membership.

The Difference in Memberships

Most of you, I suppose, have been to meetings of your own particular professional society. If you have wide academic interests you have probably been to meetings of a number of differently focused academic societies.

However, comparatively few of you will have been to the meetings of both the DPMA, and of the ACM. And yet unless you have attended both sets of meetings on a fairly habitual basis it is possible that you do not really know some of the more important facts about the two societies.

It really is one of the most startling facts of our industry that the atmospheres at the Fall Joint and Spring Joint meetings, and at ACM and computer society meetings are so different from the atmospheres at the DPMA chapter and international

meetings. There are really very few similarities between the two.

On the one hand you have academic, wide swinging, often irresponsible discussions ranging through the night between people who are on the move, who are just developing systems, who next week are moving to another part of the country, and who basically look on their profession with at least something of a national attitude.

On the other hand you have a basically local atmosphere dealing with the work that has to be done now in local installations, regarding the annual meetings as being somewhat educational junkets, rather than as essential updatings, and dealing simply with current possibilities, rather than trying to shape the future.

Insulated Leadership

And the same style of difference is carried on into the government of the societies. Many of my friends have despaired about ever getting a body as unwieldy as the ACM Council with its dozen or so members to be able to act effectively with around four meetings a year — but they have not even considered the problems of the DPMA operation where the board of directors only meets annually, and has around a hundred members!

Nor have they considered the situation of "members" who are not actually members of the DPMA itself, but only members of some local chapter. There is no national membership.

DPMA consists of a federation of chapters, each of them independent, where the individual on whom everything depends has no national rights, and in some ways does not even legally exist. Compared to the DPMA operations, the ACM's are models of representative democracy and modern efficiency!

These two facts show both the need, and the problem of DPMA. The fact that the membership populations are so totally different defines the fact that our professional spectrum is not complete unless we include the DPMA. It is a valuable asset, indeed it is really the basis, the prime mover of our industry. Without it there would be only a shadow, anemic academic operation which would soon be warped badly.

The problem lies in the mechanics of how DPMA can be saved. Looking at the structure, it may well be found to be sufficiently insulated from the effects of any immediate type crisis that it can easily fight off any attempts at reformation, and can continue in its current operation, becoming more ignorant and more ignored as the time goes on.

It may be impossible to upset the pork-barrel of chapter rights, and member weakness. It may be impractical to bring international headquarters from being a servicing organization into an effective mobilization of forces to influence national interests. It may be impossible — I don't know.

But I hope not. For one thing I do know, is that if nothing is done now, if the situation is continued to be allowed to drift, then nothing will be done in the future — and we will have to build on having a nice, little, quiet, ineffective, gardening club, which did have the idea of certification first, but which then has proved the need for someone else to take the torch from its hand — in the interest of the profession.

I would not like that, but it is a real possibility.

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Artificial Intelligence--Part 11

Greatest Benefit May Be in Understanding Humanity

By Edward J. Bride
CW Staff Writer

Many scientists feel machines with "artificial intelligence" can benefit mankind through economic and social modeling, but that ultimately the greatest advances of artificial intelligence will be in education: the intellectual benefits.

Problem-solving will be advanced through study into the thought process, according to scientists involved in the research into this field.

The evolutionary status of man will be diminished, according to others, who have created much interest in this discipline since recent articles about robot technology.

Controversy surrounding the study into artificial intelligence is really segmented into two main areas: the capability of machines to take part in the thought process — now or in the future — and the desirability of industrial automation.

While some interested persons assert that robots will help bring about increased leisure (the four-day week), improved working conditions, and will alleviate any labor shortages from successful population control programs, others fear machines which might be considered to be thinking.

This latter idea is solidly espoused in the "dehumanizing" theory.

Dr. Ruth M. Davis of the National Bureau of Standards believes that the discipline of artificial intelligence does have society-oriented goals, and that computers cannot simulate the "thought process" since man doesn't even know what the process is.

A thinking machine? "I don't

available people; where it is difficult to train and educate individuals to effect improvements in procedures.

Additionally, the product of this research could be used when there is a "chronic lack" of trained personnel, she expounded, such as happens when a new technology occurs, when

bilities as the chief area of both applicability and need. Dr. Marvin Minsky claimed his artificial intelligence research could be "an important shot-in-the-arm for the current depressed quality of educational theory."

Essentially in agreement with Minsky is Dr. Kenneth Sayre, a University of Notre Dame philosophy professor who is also director of the university's Institute for the Study of Artificial Intelligence.

Sayre explained "thinking machines" as "very flexible computers capable of solving problems of a particular type in highly structured situations." They are not "creative thinkers," Sayre stressed, and are not capable of the intuition or sensitivity generally characteristic of human thought.

The greatest benefit of machines with artificial intelligence will not be economic or social, Sayre stressed, but intellectual. The ability to build more sophisticated, flexible machinery will represent "an increase in our understanding of what problem-solving is, what human intelligence is and what consciousness is," he suggested.

Alter Its Own Program?

That understanding will be of "genuine value," Sayre explained, and may provide the basis of a "new conception of what being human is all about."

Sayre also predicted dramatic advances in communications, and in flexible problem-solvers which will emerge in the next 10 years, including, he claimed, a computer which can alter its own program in response to the environment.

'Machines Will Think'

LOS ANGELES — Machines will think — it is "inevitable" — and man will fade into the background as vast information storage and retrieval systems become prominent, according to a local scientist.

Dr. Robert McCracken, an anthropologist at UCLA, said men are becoming "adjuncts of our machines." As an example, he said cities are built "for automobiles, not for man."

The three stages of evolution are atoms, genes and culture, with information storage being the unifying feature, McCracken said. In the last stage, language is the information system, but man is no longer "efficient either at its storage or retrieval."

Thus, according to McCracken, man is obsolescent, and will be replaced by another form of evolution, over an infinite number of years.

know what thinking is," she chided.

Goals of Research

Noting it is difficult to measure the thought process, she added "without mature, reasonable, useful" applications of artificial intelligence, the research itself would be useless and therefore meaningless.

While assigned to the Department of Defense, Dr. Davis enunciated some of these areas to be served by this discipline: where operations must be performed in remote areas (space, underwater or otherwise inaccessible); when operations must be performed at a rate unattainable by the number or ability of

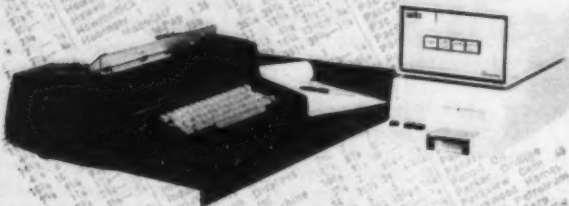
there is a traditional distaste for a job or inadequate compensation; and, as in the military, when there are administratively imposed restrictions on the number of people allowed in a given field or on the length of tenure in the field.

The use of "robots" is also important when there is a need to mass produce or to control the production of materials or of material components, Dr. Davis observed, including the control of nuclear power plants and the production of material sections of airframes.

Educational Theory

Other proponents of this science point to educational possi-

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Shorter Work Week Has Its Problems

By a CW Staff Writer

BOSTON — There are some problems with the four-day work week, like how much vacation do you give employees? And how much extra do they get for working a holiday?

A local management consulting firm may have solved these problems in an experiment with a four-day, 38-hour week in its computer section.

Administrative Advisory Corp. (AAC) instituted the plan in its DP section in December after an in-depth study, noted company President Maurice B. Weisman.

8-Day Vacation

Under the plan, employees get a two-week vacation, same as before. That is, eight days. They actually get 76 hours' vacation,

since they work a shorter week.

A day off is still only a day off, of course, but it represents 12.5% of the yearly allocation instead of 10%. A small point.

For working a holiday ("in order to maintain productivity, employees must work the other four days on holiday weeks," the company notes), the workers get a 20% bonus that week, but they worked 25% more than normal — eight hours' pay for 10 (really 9-1/2) hours work.

Some Advantages, Too

Despite some apparent inequities, the plan does offer an "improved" pay package, approximating 4%, the company claims, as a result of reduced working hours...plus the holiday pay "bonus."

Other advantages include elimination of transportation and lunch expenses one day a week, easy commuting because of the odd hours (8 a.m. to 6 p.m.), plus extra leisure time offered by three-day weekends.

Still 5 Days

The company is half-staffed on Mondays and Fridays, so it still operates five days a week; the off-day is staggered 50-50. Included in the daily schedule are a half-hour lunch break and two

15-minute coffee breaks.

Emphasizing the experimental aspect of the plan, Weisman said: "We wanted the opportunity to test the efficacy of such a plan in a controlled atmosphere before recommending it to our clients."

He said the plan had "immediate appeal to our employees," although it is still "too early to fully evaluate the results."

The Impetus

Weisman said many factors in today's business and social environment are creating an "impetus toward the shorter work week." Such factors include the general population increase, overcrowded commuter facilities, labor union pressure for more productive leisure time, sociological concern for workers in society and "great concern about the state of the economy."

Regarding this last point, Weisman claimed the program "need not be inflationary" since programs can be designed "which neither sacrifice productivity nor dictate higher wages."

Weisman claimed the increase in leisure time "could foster freer spending on goods and services and help get a sluggish economy rolling again."

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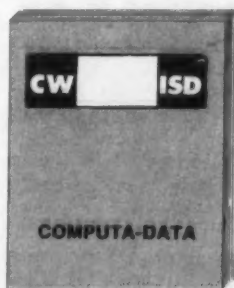
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Group I New Products and Applications

The data offered in these Reports and Profiles describe new products being offered to and by the data processing industry. Included are applications for these products as well as new applications for existing products. Reports include names of suppliers; users who have developed new applications for products; new general developments in the field.

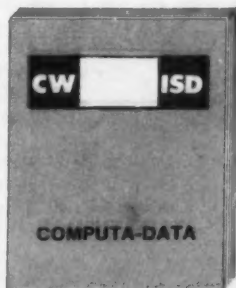


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This Profile deals with the granting of data-processing contracts. Included are contracts for hardware, software, and peripherals. The information reported includes, when available, the names of the companies involved in the contract; a statement of the proposed work; the length of the contract, its proposed start-up date, etc. (Circle No. 7)



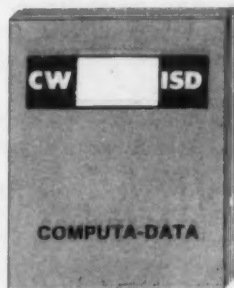
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IRS Liberal Record Requirements Were Badly Needed

Mark E. Battersby

Special to Computerworld

The Internal Revenue Service recently announced that it will now accept punched cards, magnetic tapes, disks and other machine-sensible data media used in the automatic data processing of accounting transactions as acceptable records under the rules of the Internal Revenue Code.

Clarification of this point was badly needed because Section 1.6001-1 (a) of the Income Tax Regulations merely stated: "Any person (or business) subject to income tax shall keep such permanent books of account of records, including inventories, as are sufficient to establish the amount of gross income, deductions, credits or other matters required to be shown by such person in any return of such tax."

The regulations further provide that the books and records required by this section shall be retained so long as the

contents may become material in the administration of any internal revenue law.

Acceptable Records

To clarify these rules covering what constitutes acceptable records, the IRS announced that punched cards and other machine-sensible data media used for recording accounting transactions within a taxpayer's DP system are records and fall within the meaning of Section 1.6001 of the tax regulations.

Where punched cards are used merely as a means of input to the system, however, and the information is duplicated on magnetic tapes, disks or other machine-sensible records, such punched cards need not be retained, the IRS determined.

In what could be considered a typical situation, the taxpayer would maintain records within his DP system. Daily transactions are recorded on punched cards and processed by the taxpayer's com-

puter which prints daily listing and accumulates the individual transaction records for a month's business on magnetic tapes.

At the month's end the tapes are used to print out monthly journals, registers and subsidiary ledgers and to prepare account summary totals entered on punched cards.

The summary data from these cards is posted to the general ledger and a monthly printout is generated to reflect opening balances, summary total postings and closing balances.

At the year's end several closing ledger runs are made to record adjusting entries. In other situations taxpayers might use punched cards, disks or other machine-sensible data media to store accounting information.

IRS attempts to provide fair and equitable treatment to all taxpayers using DP accounting systems and to minimize undue hardships of DP recordkeeping. It

recognizes that DP accounting systems will vary from taxpayer to taxpayer and, usually, will be designed to fit the specific needs of the taxpayer.

An ever-increasing number of informational tax returns is being accepted on magnetic tape, and only last year the IRS unveiled a "joint-filing" program whereby some returns required by both the IRS and the Social Security Administration could be filed, on magnetic tape, with the Social Security Administration and thus, all filing requirements would be met.

Any taxpayer who is in doubt as to which records are to be retained or who desires additional information regarding the magnetic tape filing of certain tax returns should contact his district director.

Mark E. Battersby is a financial and tax consultant in Ardmore, Pa.

AF T/S Supply Net Will Link 10 Bases Throughout Country

DAYTON, Ohio — The Air Force has accepted a computer system that will be the Defense Department's largest time-sharing network with 94 terminals when fully implemented this November.

The Honeywell system, Create (Computation Resources for Engineering and Simulation, Training and Education), is centered at the Air Force Logistics Command headquarters at Wright-Patterson Air Force Base here. The dual 615 system currently links 39 remote terminals to 10 Air Force bases coast to coast.

J.J. Renier, vice-president of Honeywell's Data Systems Operations, said the system will provide computational services for approximately 5,000 engineers and logisticians who plan and control the Air Force's industrial-type supply network. Create also will be used to train students at the Air Force Institute of Technology, a degree-granting institution at Wright-Patterson which specializes in scientific, engineering and management education. In addition, Create will be utilized by the Air Force Communications System.

An Air Force spokesman said the five-year \$6.9-million lease arrangement will result in net annual savings and cost reductions of \$2.1 million compared to prior systems — plus increasing the number of applications and the comprehensiveness of the calculations by people in mathematically oriented positions.

The current hardware configuration includes four remote-batch GE115s, two graphic display terminals and 13 teletypewriter terminals at Wright-Patterson. The remaining 26 terminals are operating at the other nine Air Force facilities on the network.

The two multiprogramming/multiprocessing CPUs have 256,000 words of memory, 6 char/word, and there are approximately 480 million characters of removable disk storage and a billion characters of on-line archival disk storage.

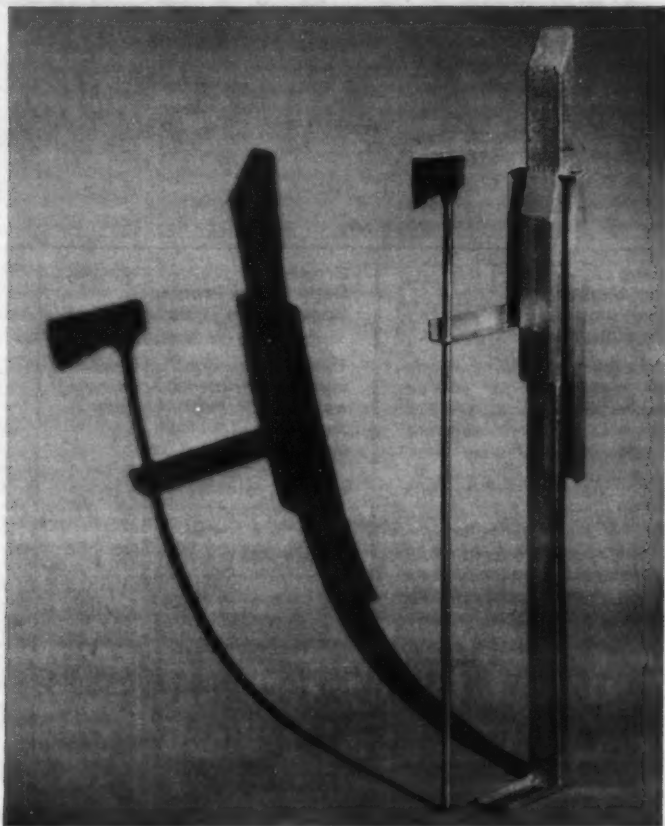
The system has three-dimensional capability — local, remote batch and time sharing — which takes place simultaneously under the control of a Gecos executive control package.

The software package includes Basic and Time-Sharing Fortran, plus Fortran IV, Simscript, Cobol, Jovial and Algol. It is anticipated that these languages will cover 95% of the system, scheduled to operate 21 hours a day, seven days a week.

Honeywell supplied all the devices and communications gear except the telephone lines.

The company will provide a total of 36,480 student hours of training prior to the Nov. 2 operational date, and the firm has had a four-man technical support team at Wright-Patterson since June 1970.

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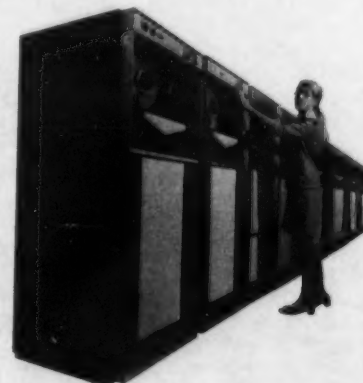
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Model 1400	\$1,200,000	Model 1400	\$1,200,000
Model 2401	\$100,000	Model 2401	\$100,000
Model 729	\$100,000	Model 729	\$100,000
Model 370	\$1,000,000	Model 370	\$1,000,000
Model 360	\$500,000	Model 360	\$500,000
Model 7000	\$1,500,000	Model 7000	\$1,500,000
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Page 15

Bits & Pieces**Gerber Photo Plotter Produces PC Masks**

SOUTH WINDSOR, Conn. — The Gerber System 40 high-precision photo plotter can produce printed circuit masks full size.

Three input media are available, buffered magnetic tape, punched tape, or an 029 card reader. The Gerber Graphic Generator program, written for the 360/30, is designed to prepare input data for artwork generation. It is available as an option.

The basic system price is \$35,000 with delivery in 90 days from 83 Gerber Road.

Dual Magnetic Tape Cassette Unit Expands Victor 800 Peripherals

CHICAGO — A self-contained magnetic tape cassette unit from the Victor Comptometer Corp., the Model 732 cassette, can be connected to the firm's Series 800 line of computers, terminal computers and data collection terminals.

One or two cassettes are controlled by a single I/O control. All processing cycles run simultaneously. After recording one block, the tape is automatically rewound to compare the recorded data against data in the buffer.

The price of the single cassette version is \$3,000 and the dual cassette model carries a price tag of \$4,800, including the controller. The units are available for immediate delivery from 3900 N. Rockwell St.

Turnkey System Gives Retailers Better Control of Credit Sales

COLMAR, Pa. — Credit Systems, Inc. has developed a system which is said to give retailers more effective control and flexibility in the authorization and monitoring of credit sales.

A typical system, suitable for use by a four-branch store with 400,000 accounts would include 500 terminals and lease for \$6,000 to \$7,000/mo. It is available on a 90- to 120-day delivery schedule from Route 309 and Advance Lane.

Tape Users Can Now Rent Cleaning, Evaluating Units

BURLINGTON, Mass. — The user who felt that his needs were too small to justify the purchase of tape cleaning systems can now rent the equipment. Computer Link Corp. will supply a tape cleaner/rewinder for \$60/mo plus costs of supplies. This allows for the cleaning for 120 2,400 ft. reels. Additional tapes cost 25 cents each.

Splicer Designed for Paper Loops

RIDGEWOOD, N.J. — The Ideal Model SC-3 Tape Splicer and Cutter from Donald, Inc. is especially suited for making tape "loops."

The device has two rows of feed hole pins, and has a floating rotary knife with stationary lower blade to ensure accurate cutting.

The splicer is priced at \$85 and available from P.O. Box 104.

Control-Rack Adds Four Models

HOLYOKE, Mass. — National Blank Book Co. has added four models of its Control-Racks for EDP printouts. Included also is a new size of its Connect-A-Ref Unit, used to form modular printout work stations, and a Slide-A-Ref changing device to handle bound printouts horizontally.

Communications Included**Mohawk System Prepares Data Off Line**

By Frank Piasta
CW Staff Writer

HERKIMER, N.Y. — By adding several new devices to its earlier peripherals, Mohawk Data Sciences Corp. has developed the System 2400 off-line peripheral processing system to handle data conversion and provide communications capability.

System 2400 is available in several configurations that include a data sorter-collector, data communicator, data converter,

data editor and an expanded configuration that performs all of these functions.

The 2400 is based on the 2405 processor that had been used in the company's earlier off-line printing systems. It can be equipped with from 4K to 32K of memory and one to four 250K byte/sec I/O channels. Cycle time is 2 μ sec/byte. Programming is done in a new language, Mohawk Data Language (MDL), designed especially for editing applications.

The introduction of tape and disk drives

were said to make the new configurations possible. Four new mag tape drives, one of which is a read-only unit, are all rated at 45 in./sec. Both 7- and 9-track models handle 200 to 1,600 bit/in. Transfer rates range from 9,000 to 72,000 char/sec. All tapes are IBM-compatible.

The disk drive is a non-compatible unit that has a capacity of 2.46 Mbyte/disk with two recording surfaces. The average access time is 70 msec and the average latency time is 20 msec. Data transfer rate is 200K char/sec.

A card reader/punch rated at 400 card/min read, 120 col/sec punch, adds to the I/O capability. Also available are two chain printers. Using a 64-character font, speeds of 200 and 300 line/min are possible. Fonts of 16, 48, 96, and 128 characters are also available in line lengths of 100 and 132 characters.

The earlier units in System 2400 include a drum printer used with Mohawk's off-line printing system, a card reader and two paper tape readers.

The Mohawk Data-Recorder can be used as an on-line unit. In the off-line mode, it is used as a normal key-to-tape device, while on-line it is used for data pooling.

The 2400 can also be used to augment the earlier Mohawk System 9000 multi-station key-to-tape configuration by adding an ability to edit output tapes.

System 2400 can be equipped with the 2401 communications controller to allow data transmission at rates of from 600 to 9,600 bit/sec over dialup or leased lines. Half or full duplex mode can be used with IBM-compatible binary-synchronous transmission. An on-line communications data-recorder is used for Mohawk Synchronous Communication.

An expanded configuration of the 2400, which includes input editing; magnetic tape processing; disk storage; output editing; printing; and data transmission, carries a lease price of \$2,910/mo.

It includes the processor, communications controller, high-speed printer, disk drive and controller, four tape drives and a data-recorder.

Current delivery schedule is six months.

Library System Automates Tape Handling, Enhances Security

By Edward J. Bride
CW Staff Writer

MOHAWK, N.Y. — A computerized tape library control system reduces manual tape handling, enhances security, and cuts CPU "waste time," according to Advanced Digital Systems, Inc.

Controlled by a GRI 909 minicomputer, the system selects and delivers reels, via a mechanical transport, to a tape drive or other desired location.

The system, called the LCS-5, includes a series of horizontal trolleys, elevators and an overhead shuttle, controlled by the mini, which accesses the required tape and delivers it to the tape drive within 10 seconds, ADS claimed.

The LCS-5 also returns tapes to their location in the library eliminating 99.2 % of human handling, according to ADS.

The first model in a planned series, the LCS-5 is aimed at Univac 1108 or IBM 360/65 installations which, according to ADS, "typically have tape libraries ranging in size from 2,500 to 40,000 reels."

A typical large installation, with 10,000 tapes operating three shifts, employs nine operators, six tape jockeys, three librarians, and three assistant librarians for manual tasks such as tape filing, retrieval and record-keeping, ADS said.

Such a site is said to spend about \$200,000 a year on direct salary and overhead for manual tape filing, retrieval and record-keeping. This can be reduced to \$40,000, including costs for the system, personnel, and overhead, ADS said.

The LCS-5 system, the company claimed, could reduce this work force to one per shift.

For IBM Model 65 users with OS, the main computer can request tapes directly, eliminating any operator interface at the mini. With other systems an operator keys in the required tape identification codes.

The LCS-5 stores tapes in modules of 1,000. Each module is blast-proof to a limited degree (able to withstand a molotov cocktail, according to the firm), and is inherently capable of avoiding damage from external magnetization. Another security feature requires a 10-digit code to be keyed in before confidential tapes can be accessed.

For a 10,000-tape library, the system will lease at \$7,900/mo or can be bought for \$400,000. The company claimed the purchase cost could be amortized within the first year for installations spending \$4 million annually on their equipment.

First deliveries are scheduled for next December from 146 West Main St.

Disk System for HP 2114A Provides 3 Mbit Capacity

HAYWARD, Calif. — A fixed disk and controller system for the Hewlett-Packard 2114A minicomputer, from Dynacoustics, Inc., offers capacities of from 512K to 3 Mbits.

The 501H operates over the I/O bus of the mini and requires only a single circuit board slot in the processor to provide both control and interface.

The average access time of the head-per-track device is 8.5 msec. Parallel 16-bit word transfers are performed at 30K word/sec under program control.

The 501H is supported by a software system consisting of I/O driver subroutines compatible with BCS, disk operating system, and disk diagnostic program. The software is included at a price of \$5,800 on a 30-day delivery from 1980 National Ave.

Three DEC Physics Analyzer Systems Incorporate PDP-8 or PDP-15 Minis

MAYNARD, Mass. — Three computer-based pulse height analyzer systems from DEC are based on the PDP-8 and PDP-15.

The 250,000-channel disk analyzer system incorporates a PDP-15 and disk storage unit. It sells for \$63,000.

The background/foreground analyzer also uses the PDP-15 and can perform 8,192-channel single or dual parameter analyses.

The lowest priced system, the PHA-8/E uses the PDP-8/E and is priced at \$12,340 for single parameter 1K or 2K channel analyzers.

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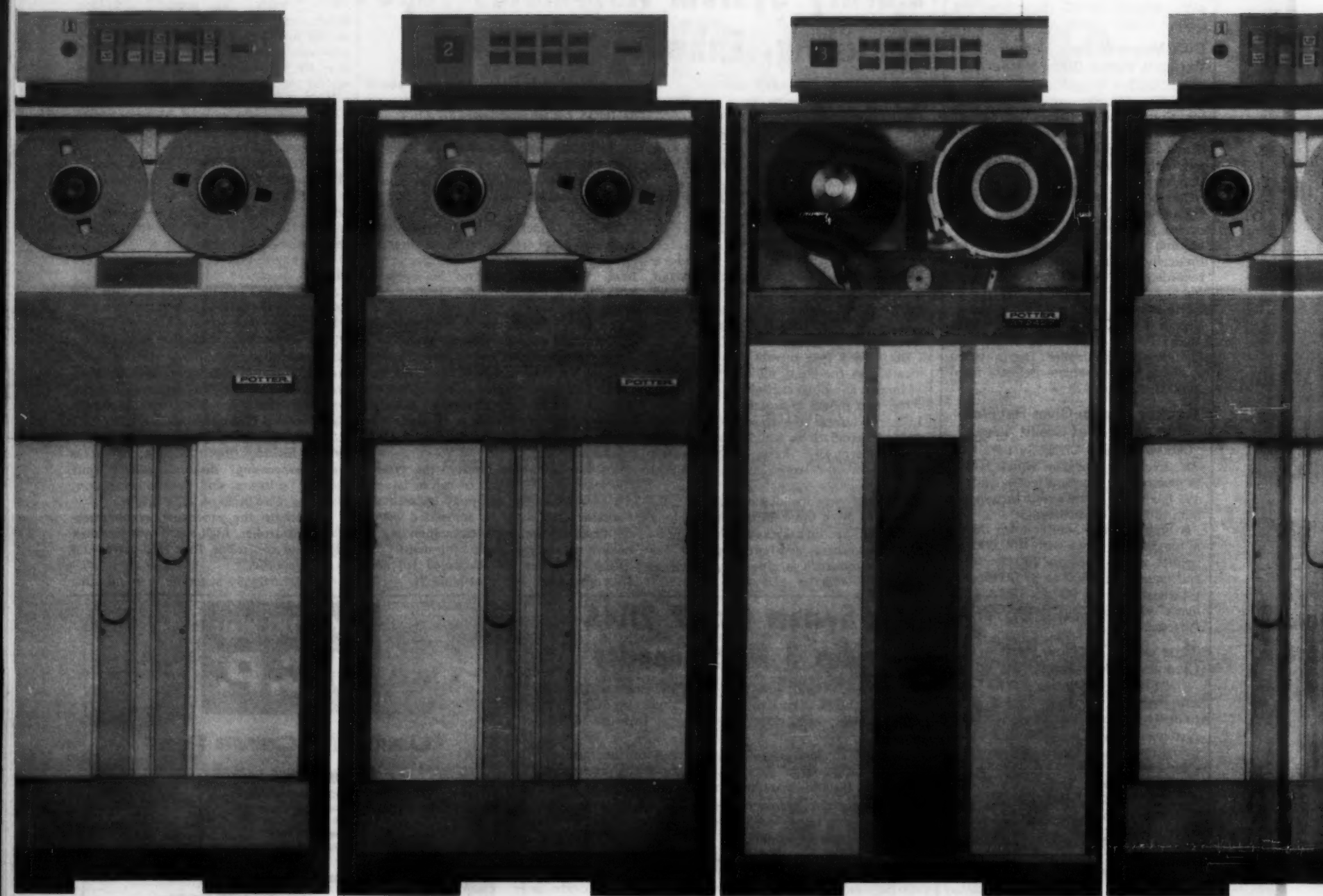
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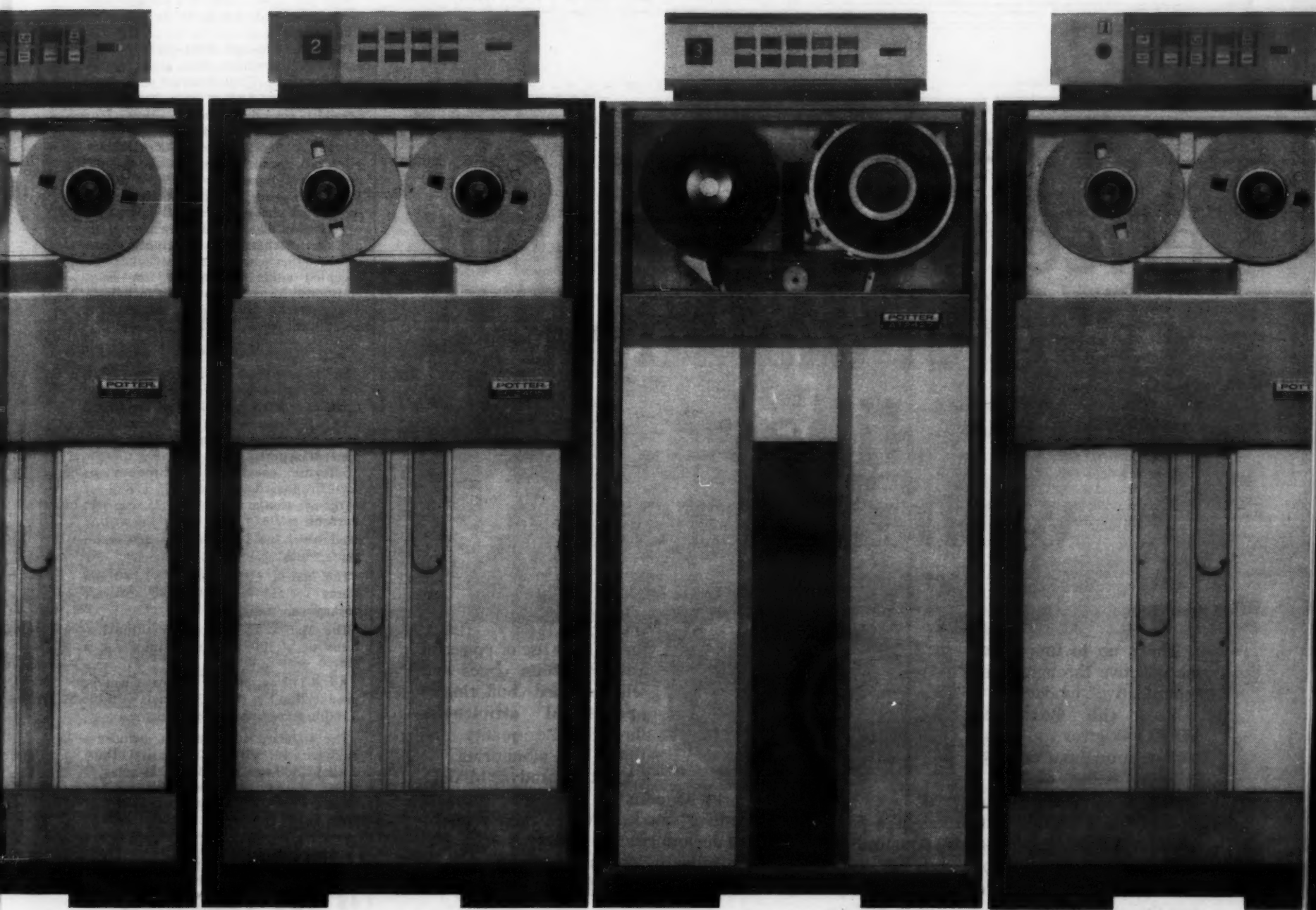


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CRT Has Microprogrammed CPU

CAMBRIDGE, Mass. — The Model 100 interactive CRT terminal from Computek, Inc. incorporates a self-contained microprogrammed processor.

The design is said to reduce instruction program size by about 20 to 1 over conventional units. Such operations as editing, split screen, scrolling, peripheral management and data communications can be microprogrammed, Computek said.

The 4K memory has an access time of 1.5 μ sec per 16-bit word. It is programmed with a software assembler package that runs on larger time-sharing systems, such as the DEC PDP-10. A separate refresh buffer is linked to the CRT through a direct memory access channel.

The character set consists of 64 Ascii characters generated on a 7 by 9 matrix. The standard page format is 50 by 20.

The keyboard is available in both typewriter and Teletype formats, with 68 keys including a 10 key numeric or special function set.

The terminal may be configured with cassette and disk storage, keyboard, and OCR input; typewriter, printers and other hard copy outputs.

Field maintenance is available through the Honeywell service organization. The Model 100 costs \$5,200 on a 90-day delivery schedule from 143 Albany St.

Variable Size Input

Mark Reader Scans Page, Cards

OAKLAND, Calif. — A desktop optical mark reader from Decision, Inc. can scan various sizes of documents. The manually fed OMR 650 can read punched cards as well as any size mark-sense documents up to 8-1/2 in. by 11 in., the company said.

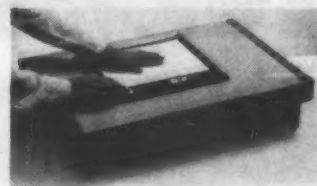
Designed to read forms of several sizes, the unit can transmit data in either Usascii or Ebcidic code up to 2,400 bit/sec at all standard frequencies.

The device will read any one mark format specified by the user, Decision said. IBM, Digitek, or other mark formats can be handled. A special "Decision" format allows as many as 4,000 mark positions to be scanned on

a single page, the firm said.

The unit uses a strobe light to detect marks which are stored in a 96-bit memory. The data is then translated.

The OMR 650 is priced at \$200/mo or \$4,500. The unit is available on 45-day delivery from 5601 College Ave.



OMR 650 Mark Reader

Three Electrostatic Devices Provide Quiet Operation

CUPERTINO, Calif. — A printer, a plotter and a printer/plotter from Versatec use the firm's electrostatic writing technique.

Called the Matrix 1300 printer, Matrix 1100 plotter and Matrix 1100A printer/plotter, the units use 11-in. paper and complement the firm's 80-column units that are currently available.

The devices feature silent operation and versatility in printing both graphics and alphanumerics. They interface with most minicomputers and provide hard copy capability for CRT terminals.

The Matrix 1300 printer is a 132-column unit priced lower than impact printers with comparable speeds, according to the company. A 7 by 9 dot matrix is used to print 300 line/min (660 char/sec). A 64 character set read-only memory (ROM) that decodes Ascii input to dot matrix characters is included. Data can be either parallel or serial and can be accepted either synchronously or asynchronously. The standard unit includes a 132 character buffer. The unit price is \$6,700; the lease price is \$230/mo.

Graphic Plotter

The Matrix 1100 plotter is a hard copy device that produces graphic plots in the form of dotted lines. Digital electronic scan operation is said to eliminate all moving parts in the unit except for the paper transport.

Software generated synchronous or asynchronous data is input in 128, 8-bit bytes per scan at the rate of 75 scan/sec. Each bit relates to one nib on the writing head which has 100 nib/sq in. across the paper width.

The Matrix 1100 sells for \$7,200 and leases for \$240/mo. Graphic software packages are available.

The Matrix 1100A combines the features of a 300 line/min printer and a raster scan plotter.

An 8-1/2 in. by 11 in. page can be produced in less than 13 seconds with the 1100A, according to the company.

The standard configuration includes a 132-character buffer. The Matrix 1100A costs \$8,800 and leases for \$290/mo.

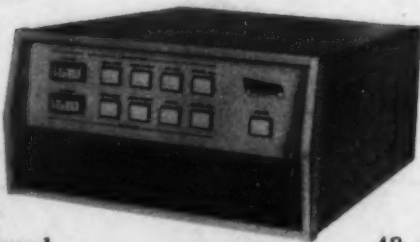
The Matrix 1300, Matrix 1100 and Matrix 1100A will be available next July from 10100 Bubb Rd.

4800 bps effective throughput over dial-up lines with no errors

That's up to four times the effective throughput of "competitive" modems.

Yes, the Paradyne MARQ-48 gives you an effective throughput of 4800 bps on either dial-up or leased lines. This is achieved through such innovative features as a 5112 bps bit rate, automatic adaptive equalization, and powerful error control*.

Benefits of MARQ-48 usage include • system throughput improvements due to elimination of error-recovery overhead and data-blocking restrictions • improved reliability



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*continuous transmission ARQ using a simultaneous ACK/NAK "reverse channel" which eliminates line turnaround.

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Turnkey Front End Is 360-Compatible

FULLERTON, Calif. — The Tempo Computers Inc. 270T Terminal Control Processor is a programmable front-end communications subsystem for use in medium-to-large scale IBM 360/370 teleprocessing systems.

Designed as a turnkey offering with software, hardware and system integration included, the Tempo 270T provides IBM 2701/2/3 terminal control unit compatibility and complete Btam/Qtam/Tcam compatibility. No 360/370 software changes are necessary, the firm said.

The 270T is available at a lease rate of \$3,300/mo (including maintenance) for a 96-line system from 4005 W. Artesia Ave.

Data Problems Stressed

CSMA to Provide Technical Aid to Users

By Ronald A. Frank
CW Technical News Editor

WILMINGTON, Del. — A new society for data professionals and users, the Communications Systems Management Association (CSMA), has determined qualifications for membership and completed plans for its first national conference. The organization will be dedicated to providing technical aid to data users.

CSMA membership will be "very broad" to include communications-knowledgeable persons using voice or data, hardware or software, a spokesman told CW.

Although the initial criteria seem designed to encourage new members, CSMA is also planning a certification system that will determine qualified data professionals. Two classes of members will make up the society with full membership including dues of \$30/yr. An associate membership will also be established.

CSMA will hold its first of two annual conferences on May 21 and 22 at a New York hotel, according to a spokesman. The theme of the conference will center on the controversy between the existing common carriers and the need for proposed specialized carriers.

PDP-8 Monitors Canadian Link

VANCOUVER, B.C. — An uninterrupted flow of microwave communications has been assured in this portion of Canada by means of a DEC PDP-8/I-based monitor and analysis system developed by the British Columbian Telephone Co.

One of B.C. Telephone Co.'s major communications paths is the Northern Interprovincial Radio System covering more than 750 miles with a chain of microwave repeaters through which flow 2,400 communications channels.

The checkout system automatically monitors the status of equipment at the repeater sites. Checked are transmitters, power supplies, and other critical factors.

If there is trouble with radio transmission, for instance, the computer can be ordered to switch the system to a standby channel. Upon command, it can activate standby generators in case of a commercial power failure.

Ash Council Urges Cut in FCC Members

CW Washington Bureau

WASHINGTON, D.C. — The Ash Council has recommended that the Federal Communications Commission be reduced in size from seven to five commissioners.

This recommendation was one of a number of proposals aimed at reorganizing and restructuring seven major independent regulatory commissions in the Federal Government made by President Nixon's Advisory Council on Executive Organization, commonly called the Ash Council.

CSMA was formed early last year after AT&T announced the closing of its Cooperstown, N.Y., training center for Bell data consultants.

In discussing projected CSMA benefits, a spokesman told CW

Communications

that the organization will publish a regular newsletter and provide "technical expertise" to solve member's communications problems.

As CSMA grows, it will become active in regulatory and other issues affecting data users.

The exact role of AT&T and

the Bell operating companies with regard to the society appears conciliatory. Among the present officers are three current employees of the Bell System.

What Bell's position would be if CSMA were to take an anti-AT&T position on regulatory matters is not clear but Bell employees will probably make up a large portion of the society's members, according to an industry observer.

Current CSMA officers are William Rush, president; Robert DeLuca, secretary-treasurer; Lloyd Wissmer, vice-president; and Daniel Nichols, vice-president.

Additional information concerning CSMA activities is available through Box 2805, here.

Map/TP Helps Phone Planning

WILMINGTON, Del. — Users of communications equipment can gain help in everything from preliminary decision-making to final implementation and operation with the Management Assistance Plan for Tele-Processing (Map/TP) service from International Telecontrol Corp. (ITC).

Geared to the needs of the individual user, Map/TP can start with basic teleprocessing seminars for management. It can extend to program maintenance and also provide for new system functions.

In the systems analysis and design phase, Map/TP includes studies of operational requirements and of computer/communications specifications. Reliability analysis and acceptance test specifications can also be provided, the company said.

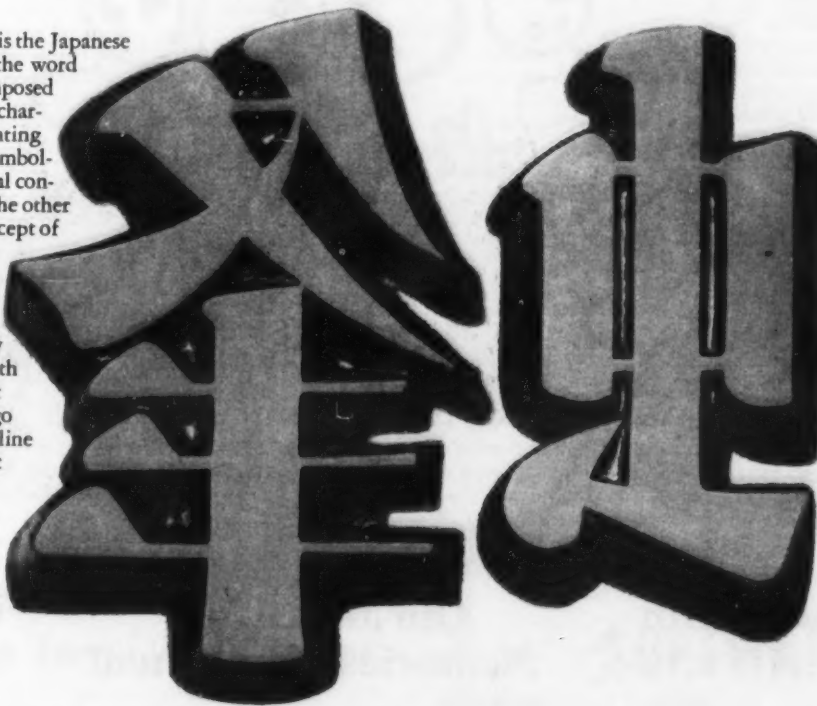
If Map/TP is used for project management, it can cover task definition and effort analysis, estimates of personnel needs and project control scheduling. Both the definition of request for proposals and the evaluation of the vendors' responses can be included in Map/TP.

Under Map/TP, ITC said that it is able to provide the user with technically competent programming and operating staffs, or to train the user's personnel in these duties.

Consultation and training under Map/TP would cost the user about \$25/hr for each ITC employee at the user's site. The firm is at 4300 Pine St.

This Japanese character demonstrates how you can personalize your printout with the unique Bright Industries' BI 1215 Bar Printer. You may choose literally any type face in any language, and in any size to one-quarter inch. Fonts can be changed in the field in minutes.

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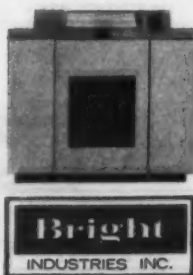


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- Our *Independent Peripherals Inputs Supplement* closes Feb. 5. Reserve your advertising space by filling out the coupon below, or contact your local Computerworld representative.

Our March 31st Memories Supplement

- will feature:
- Which user sites can make best use of bulk memories?
 - Can independent suppliers continue to provide savings to computer users?
 - The trend to disks.
 - What can independents offer besides lower prices?
- Our *Independent Peripherals Memories Supplement* closes March 12. Reserve your advertising space by filling out the coupon below, or contact your local Computerworld representative.

Our April 28th Outputs Supplement

- will feature:
- Which users can make best use of COM (computer output microfilm)?
 - Can plotters have any applications to business?
 - Printers – impact vs. non-impact, speed vs. copies.
 - Is off-line output worth the cost?
- Our *Independent Peripherals Outputs Supplement* closes April 9. Reserve your advertising space by filling out the coupon below, or call your local Computerworld representative.



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Random Notes

HP Offers Low-Cost Time-Share Packages

PALO ALTO, Calif. — Any Hewlett-Packard computer can now be converted into a mini time-sharing system for access by up to eight users with the addition of \$10 worth of software and teletypewriter terminals.

The two software packages are compatible with Hewlett-Packard's Education Basic System.

The first, the Pacific Union College system can accommodate up to eight terminals. It operates with computer memories from 8K to 32K words.

The second, the Montana State University package accommodates up to four teletypewriters and is an 8K word system that performs matrix operations and does system accounting. Minimum hardware requirements include 16K words of memory, a time-base generator, paper tape reader and teleprinter.

Punched tapes and documentation for the Pacific Union system cost \$10. Documentation alone is \$2. Tapes and documentation for the Montana State package cost \$80, and documentation is \$5.

Accounting System for Schools Meets U.S. Requirements

ATLANTA — An accounting system from Contracts Computer Services, Inc., designed for use on 360/20s by educational institutions, produces reports that conform to U.S. Office of Education formats.

The General Ledger and Budget Status Reporting System is suitable to satisfy the requirements of local state and government agencies, according to the company.

The system produces the following reports: transaction listing by input type, general ledger, budget status, equipment listing, and outstanding purchase orders.

The system is available at a cost of \$2,500, plus installation, from 100 Peachtree St. N.E.

Help Offered Churches by MLISC

MINNEAPOLIS — Churches will be able to save staff effort, improve member communications and, possibly, increase income through the DP capabilities of the Ministers Life Information Services Corp.

Specializing in accounting procedures, particularly for pledge and gifts, the company said that its services will be useful to churches with a few hundred members, or to entire denominations, with thousands of members.

Qwik-Trieve Available for 70/46

PITTSBURGH — RCA Spectra 70/46 users can now define, create, retrieve and display data in multifile data bases with the Qwik-Trieve generalized interactive system from Westinghouse Tele-Computer Systems Corp (WTSC).

The system is being implemented on the Burroughs B6500. The company also plans to adapt Qwik-Trieve to the DEC PDP-10 series. WTSC is at 2040 Ardmore Blvd.

Corning 904 Software Expanded

RALEIGH, N.C. — Software programs that provide crystallographers with three-dimensional crystal structure plots, called Unitcell are available from Corning Data Systems, for use with the Corning 904 CRT terminals.

Corning Data Systems Inc. is at 3900 Electronics Drive.

GA 18/30 Stresses 1130 Compatibility

By Don Leavitt

CW Staff Writer

ANAHEIM, Calif. — Users who have nearly outgrown their IBM 1130 systems can move up to a General Automation

18/30 system, to avoid conversion problems. Programs written for the IBM equipment will run without change on the GA processor, and an improved operating system gives the 18/30 access to

twice as much disk memory as the 1130.

The combination of software and hardware capabilities available on the GA 18/30 make it roughly equivalent in power to a 360/30, the company claimed, at a much lower price.

The Super Disk Monitoring System (Super DMS) used with the 18/30 is a batch processing system. Although primarily intended for engineering and scientific applications, it also has commercial uses, GA said.

In addition to supporting two 2311-type disks with five million words of storage, Super DMS can support magnetic tape, plotter, paper tape I/O, and a high-speed card reader.

A 'roll-in/roll-out' feature allows program swapping for rapid response to requests for data during long runs. Direct data acquisition and on-line file modification are also possible with this feature, GA said.

Under Super DMS, the GA 18/30 can use 1130 object programs without modification, the company said. In addition, Fortran and Assembler language programs from the 1130 can be recompiled on the 18/30. But Cobol and RPG are not presently supported under Super DMS.

In addition to a Fortran compiler and an Assembler, Super DMS includes a supervisor, a disk utility and full subroutine library support. Utilities for disk copy, mag tape copy and initialization are standard, GA said.

The basic GA 18/30 system, including 8K memory, one disk, card reader and line printer, with basic DMS software costs \$60,000. Additional memory, up to 32K words, is available at \$4,000/4K words. The firm is at 1055 South East St.

Clarification

A recent reference to Powerpak as "another spooling package" [CW, Feb. 3] was somewhat misleading, according to the developer, Computer General Corp., of Washington, D.C.

To provide unit record I/O spooling, Powerpak includes the logic of IBM's Power package. To that base, however, Powerpak adds overlapping of job setup and execution, and the spooling of tape I/O.

Multiple Paths Open to User For Solving Payroll Problems

By Don Leavitt

CW Staff Writer

Data processing folklore says that a payroll was one of the first applications run on computers. The array of packages available confirms that most users are interested in this application.

But conversations with users by CW indicate that payroll preparation and accounting is not a bread-and-butter application that everyone has fully optimized. The fact that many packages are available suggest that many users need help in coping with payroll problems.

What are these problems? Can users solve them through in-house programming, or should they use commercially available packages? Does the use of an outside package bring the user new problems?

The complexity of mixed pay bases, hourly, piece-work, incentive, overtime and salaried classifications may cause some software problems but probably no more than in the non-computer payroll environment.

Perhaps the biggest problem is the need for software to respond accurately, completely, and on a timely basis to changes imposed by others, particularly tax jurisdictions. In these cases, logic errors that generate miscalculated amounts can't be offset by credit or debit memos, as might be the case with accounts receivable.

Faced with this type of problem, the user can decide to stay with the manual system he has, or he can design and program his own payroll software system. He can either bring in a package or he can farm his payroll processing out to a service bureau.

Designing a system and programming it

in-house from the ground up may in large measure be reinventing the wheel. If well done, it can provide the user with exactly what he wants. Changes to a user's existing system are often easier than changes to a system brought in from outside, especially if the logic is well documented.

Use of a package allows the system to get on the air in a short time but it still requires certain work on the part of the user. He must, for example, still go through a full systems study so that he knows exactly what he wants. Only then can he judge whether an outside package will serve his purposes. And he certainly has to run enough tests. Debugging, no. Testing, yes, is the rule with payrolls. There is no room for incorrectly printed checks.

To be prepared for possible tax calculation changes, the user had to determine whether he or the vendor takes responsibility for mandatory changes.

Use of a service bureau may solve a lot of problems, but it also brings on some of its own, according to some users. Time lag between preparation of input data and delivery of the checks and supporting paperwork is one problem.

More significantly, the user generally has to bend his payroll system to fit the bureau's installation and this can be at least irritating.

The bureau is, of course, responsible for maintaining the system in terms of tax changes, and that is a major blessing in the eyes of some users.

Some users point to the anonymity with which a service bureau handles multiple payrolls as a way of keeping sensitive parts of payrolls away from unauthorized personnel in their own company.

TLS Uses Virtual Memory, Handles Large 1130 Arrays

CW Midwest Bureau

RIGHTON PARK, Ill. — Users of the IBM 1130 can program array handling problems as if they had 500K words of core, with the Two Levels of Storage (TLS) software package from Data for Management Decisions Inc. (DMD).

TLS was developed by Cybernetics Research Consultants, Ltd., of London, England. It is a virtual memory system which expands the apparent primary memory size of the computer by utilizing part of the disk area as an extension of core.

Handling all of the program instruction automatically, the programmer is required by TLS to put a sample instruction in the beginning of the program and then program as if his computer had a 500K memory, the company said.

TLS will only handle real variable arrays, DMD said, but it can move these out of core in arrays of up to 16,000 real variables to a total of 200,000 real variables.

By storing most of his arrays on disk, the TLS user gains space in core for additional instructions to handle the arrays, the company said.

A small buffer in core will always contain part of the arrays that are handled with TLS. The system attempts to assure that the part of the array most likely to be used next in the operation will be in the core buffer when required. This "outguessing," DMD said, is performed by certain optimizing routines.

The package is available on an indefinite license for \$3,000, but monthly terms can be arranged, the company said. The firm is at 22335 Governors Hwy.

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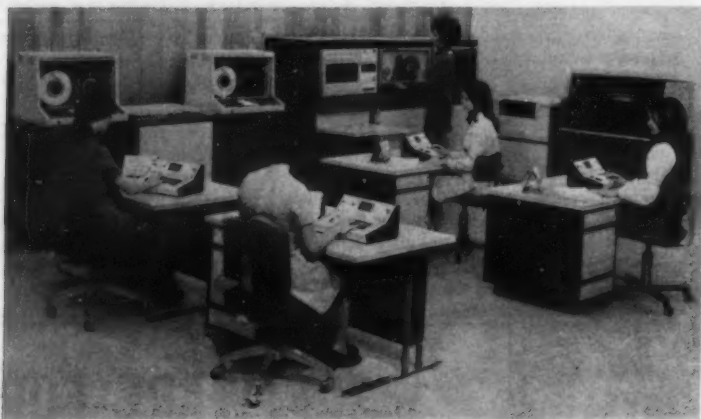
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Data-Printer

Configure it yourself. Because it's modular, the 2400 can be dedicated to do your specific jobs, in a cost range starting at \$600.

In its expanded configuration the 2400 edits input, edits output, sorts and merges magnetic tape, reformats and prints, commits reference data to disc, and gives you high speed BSC data transmission.

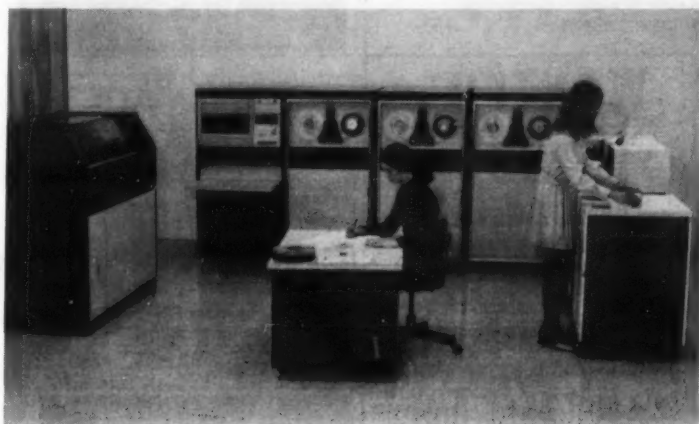


Data-Communicator

As an editor, the 2400 will take raw keyboard data and rearrange, reformat, perform any kind of validity checking, range testing, sequence checking, and conditional value testing. It will pool or merge data from various keyboards or from different media. It will select and sort the records needed for a particular run. It will produce one edited reel of magnetic tape ready for processing.



Data-Converter



As a communications terminal, the 2400 can take a tape that wasn't originally edited for communications and transmit it in compressed, control-coded format. It can convert data received in any code or format, and it will translate, reformat, and output data any way you want.

The 2400 can go from any one medium to any medium or mediums your computer prefers.

Data-Sorter/Collator

As a converter, the 2400 can convert from cards, mag tape, paper tape, communications, and keyboard—to cards, mag tape, paper tape, communications, and line printing.

The 2400 can, in fact, satisfy all your utility needs with off-line simplicity. It's our new generation of peripheral control, timed to meet the newest generation of computer equipment.



Mohawk Data Sciences Corp.

Herkimer, New York



Mohawk Data's System 2400. Peripherals come of age.

CAI Benefits Deaf Pupils

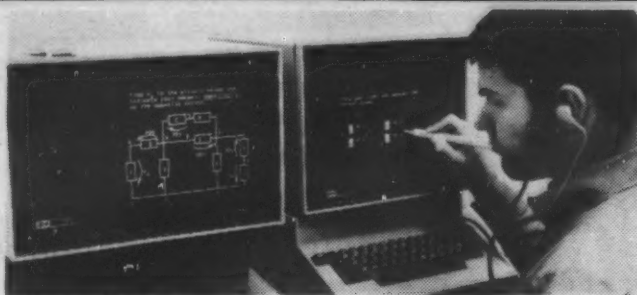
ROCHESTER, N.Y. — Computer-assisted instruction is helping deaf students at the Rochester Institute of Technology prepare for college-level technical studies. The course, sponsored by the National Technical Institute for the Deaf, is also providing useful data on

Education

computer teaching methods for the deaf.

Individual Basis

A major benefit of the technique, according to Dr. Dennis Barnes, director of CAI, is that each student interacts with the visual instructional material on an individual basis. While the student progresses at his own pace, the computer, an IBM



Michael H. Boyd uses a terminal linked to an instruction system to study electronic circuit analysis.

1500 instruction system, compiles data on his performance for future analysis.

More than 50 students have completed a course in mathematics and additional courses in thermodynamics, biochemistry and electronic circuit analysis are planned.

The students work at 10 terminals linked to the computer, which has been programmed with course material in mathematics. Each terminal has a CRT, a standard keyboard, an image projector for displaying photos or drawings and a "light

pen."

Lesson material and test questions are flashed on the screens and the student responds by typing on the keyboard or touching parts of the image on the screen with the light pen.

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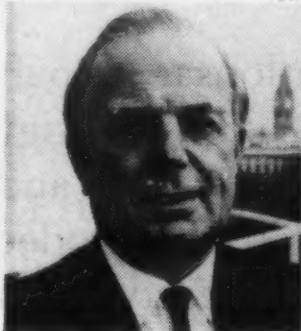
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Sir John Wall

Sir John Wall To Keynote SJCC

WASHINGTON, D.C. — Sir John Wall, chairman of the Board of International Computers Ltd., will deliver the opening keynote address at the 1971 Spring Joint Computer Conference in Atlantic City, N.J., May 18-20.

An internationally recognized authority on the DP industry and the world business scene, Wall will discuss the increasing responsibilities of the information processing field during the 1970s, the implications of such responsibilities on the interna-

tional scene, and the need for expanded communication among the manufacturing and user communities on a world-wide basis.

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March 3, 1971

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CI Notes

Viatron Files Chapter 11

BEDFORD, Mass. — David and Goliath, computer style: Three creditors, owed a total of less than \$4,000, threaten to drive Viatron Computer Systems into bankruptcy with a petition charging the terminal-maker can't pay its bills.

The petition was filed Feb. 23 by Manpower Inc. (Minneapolis, owed \$3,366 for services), Certified Business Forms Inc. (Newton, Mass., \$331 for labor and materials), and National Data Communications Systems Inc. (Somerville, Mass., \$204 for merchandise).

Viatron has responded by filing a petition for arrangements under Chapter 11 of the Bankruptcy Act seeking a form of settlement with creditors other than payment of cash.

In its petition Viatron listed assets of \$1.9 million and liabilities of \$24.8 million.

GAO Award Procedures Protested

The General Accounting Office (GAO) is expected to issue a report in about a month regarding a protest filed recently by Storage Technology Corp., Boulder, Colo., against a peripheral equipment contract pending at the Defense Supply Agency.

Storage Technology is protesting what it calls "improper evaluation factors" used in determining who will get the award for 155 units, including 126 magnetic tape drives and 29 disk storage devices. A spokesman for DSA said that award of the contract is awaiting disposition by GAO of the protest.

Burroughs Opens Factory

LONDON — Burroughs opened its third Scottish factory, at Glenrothes, Fifeshire, and announced that new product lines — the exchangeable disk store — would be introduced into manufacture in the UK.

Supershorts

Computer Jobs Through Training is seeking corporate brochures and product examples to be passed out or demonstrated during a promotional trip through California. The group offers high-school business and vocational teachers an 8-hr. course on computers, and can be reached through P.O. Box 109, La Jolla, Calif.

The DTS 100 remote batch data communications terminal made by the Noller Division of Badger Meter, Inc. of Milwaukee has been awarded a GSA supply contract for EDP procurement.

Data General Corp. has announced initial deliveries of its Nova 1200 minicomputer two months ahead of schedule. The first Nova 1200 was delivered to the Analytical Systems Division of Bausch and Lomb in December.

The proposed Ampex mainframe replacement memory for the IBM 360/30 (CW, Feb. 10) would not be the first. Units are already offered by Fabri-Tek, Inc. and Data Recall, Inc., which markets its units through Computer Investors Group, Inc.

Displays, Memories

GE, RCA Reveal Solid-State Devices

PHILADELPHIA — A new technique for interconnecting light-emitting diodes (LED) for displays and the development of sub-nsec switching silicon-on-sapphire circuits for memories were reported last week at the IEEE International Solid-State Circuits Conference here.

The GE-developed process that allows interconnection of LEDs without the need for separate wiring for each unit is a semiconductor process based on gallium phosphide.

RCA's new silicon-gate silicon-on-sapphire (SOS) CMOS inverters operate as fast as emitter-coupled bipolar transistor gates, but only dissipate one-millionth of the standby power consumed by the bipolar circuits, according to Dr. William M. Webster, vice-president of RCA Laboratories.

With the GE process, a panel containing 7,000 LEDs and capable of displaying 200 characters simultaneously can be fabricated with 1,200 interconnections on the display surface. Future variations of the same technique will reduce the needed interconnections to 200, compared to the 14,000 interconnections (7,000 die bonds plus 7,000 wire bonds) required in a panel fabricated by other processes, GE predicted. In addition, the GE panel requires only 170 external leads.

The development of GE's new process and its application to a complex array of light-emitting diodes was performed at the company's research and development center by Dr. Allen M. Barnett, Dr. Simeon V. Galginitis, and Frederick K. Heumann, authors of the technical paper presented here.

To form a single character in a display

panel, 35 of the LEDs are combined in a rectangular array five rows across by seven rows down.

The light-emitting diodes and their interconnections are fabricated — presently as many as 2,000 at a time — on a wafer of gallium phosphide, and the number is expected to increase sharply.

The matrix-addressable light-emitting diode arrays are operated on a time-shared basis. Therefore, each emitter is activated in a pulsed mode. This monolithic matrix has an average brightness of 50 ft-lamberts at an average current of 1 mA when operated at 120 Hz.

With the RCA SOS circuits, nsec switching delays can be obtained even when operated at bipolar voltage levels, so that the buffering normally required between

high-voltage MOS and low-voltage bipolar circuits can be eliminated, Webster said.

Therefore, the high speed CMOS/SOS circuits can be directly interfaced with high-speed bipolar circuits and operated from a single power supply.

By employing polycrystalline silicon gate electrodes in the CMOS transistors rather than aluminum gates, RCA was able to fabricate 5-micron channel spacings between the source and drain regions of the transistors, said Edward J. Boleky, in presenting a paper.

A 25-stage ring oscillator was used to evaluate the switching performance of 5-micron-channel CMOS/SOS silicon-gate inverters. With a 15 V supply voltage, a stage delay of 0.55 nsec was measured, and with a 5 V supply voltage, 1.8 nsec.

Series 6000 Underlines Problem Of Fragmented Market Base

By E. Drake Lundell Jr.

CW Computer Industry Editor

NEW YORK — Introduction of the new 6000 series of computers by Honeywell points out the major problem that Honeywell will have to face for the next few years — a fragmented market base caused by the merger with GE.

Honeywell presently has about 12,000 systems installed worldwide with slightly more than 50% of the installations using GE equipment. The former Bull-GE operation also has approximately 2,000 tabulating installations in Europe.

At the same time almost 1,700 of the 7,000 computer installations in Europe are using the small-scale machines in the 50 series developed by GE.

Honeywell wants to upgrade the Bull tabulating market to series 50 machines and then on up the line — so it will have to offer two essentially incompatible lines over the next five to 10 years, since series 50 users (unless they are using the new Cobol option) cannot upgrade to the former Honeywell line of computers.

For the present at least, Honeywell Information Systems will continue to support and develop both product lines that were offered before the merger, according to C.W. Spangle, executive vice-president of Honeywell and chief operating officer at HIS.

Spangle predicted that by the "end of this decade" HIS will be offering one line that will be compatible and that will allow conversion from the former Honeywell and GE computer series.

But, for the present, HIS is not offering compatibility between the GE and Honeywell lines and is marketing to two separate installed bases. And, not only will HIS not guarantee conversion from IBM equipment to the new lines, it apparently will not guarantee conversion for a user of GE equipment that wishes to upgrade to Honeywell equipment or vice-versa.

The steps that have been made toward compatibility are so far minor — Cobol for the 50 series and the 279/DSS190 disk unit.

So, it appears that HIS will have identity problems until the next generation of computers is announced, and design problems since it will have to make a system compatible with incompatible equipment.

Fairchild Develops New Process To Increase Bipolar Density

SAN FRANCISCO — A semiconductor structure that may make it possible for bipolar circuits to equal the current packing density of MOS circuits while retaining the speed advantages of bipolar devices has been developed by Fairchild Camera and Instrument Corp.

The technique, which is called Isoplanar, will make possible a 40% reduction in the size of bipolar devices, according to the firm.

The Isoplanar process utilizes planar oxide to achieve the sidewall electrical isolation of integrated circuit components, noted Dr. James Early, vice-president of research and development. Current techniques produce this effect through diffusion.

The new technology shows promise of increasing yields and reducing production costs, in addition to nearly doubling

packing density, Early said. The size reduction is attainable because transistors isolated by Isoplanar are approximately 40% smaller than those using current isolation methods.

The increase in yield is possible because structures made with the Isoplanar technique are less sensitive to defects that may occur in the masking, or photo-etching, steps of the manufacturing process, and because the surface of the circuit chip is flat, making the metalization step simpler and more reliable, according to Fairchild.

Plans call for the company's first Isoplanar product, a 256-bit random-access memory, to be introduced in the second half of 1971. Eventually the process will be applied to much larger memories, it said. No substantial sales are expected, however, until 1972.

SJCC Exhibit Space Available

MONTVALE, N.J. — There is still plenty of exhibit space available for the Spring Joint Computer Conference, to be held in Atlantic City in May.

In the past, the "joints" have been sold out as much as four to six months in advance, but as occurred last fall, a sluggish economy is intimidating prospective exhibitors.

Latest figures show about 160 organizations plan to exhibit, about half the prevailing number up to last Spring.

Organizations wishing additional information should contact Donald Cruzen at the headquarters of the American Federation of Information Processing Societies, sponsors of the semiannual events. Afips is located at 210 Summit Ave.

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NMA Plans to Issue Standards

NEW ORLEANS — The National Microfilm Association (NMA) will begin issuing industry standards, with the first one expected in mid-May, the NMA's standards board announced at the recent mid-winter meeting.

The NMA standards will be issued using the metric system of measurement, according to Don M. Avedon, chairman of the standards board.

"The new plan will require NMA sustaining members (ven-

dors) and associate members (users) to cast written ballots before the standards are issued," Avedon said. The proposed standards will also be published in the NMA journal for comments from the field, he added.

The decision to express dimension in metric units will apply only to NMA industry standards, but all vendors are being requested to consider the same practice on new specification sheets, in trade literature, on

packages and other items carrying dimensional designations, Avedon said.

In developing and approving industry standards, Avedon said once a standard is proposed by a committee, it will be reviewed by the standards board and published in the journal.

Comments will be considered and the proposal revised if necessary and then submitted to sustaining and associate members for written vote.

If a consensus is established, the industry standard will be issued and also submitted to the American National Standards Institute (Ansi) for consideration as a national standard.

Informatics to Design House Display/Retrieval System

CW Washington Bureau

WASHINGTON, D.C. — A display/retrieval system that would enable the House of Representatives to handle voting and quorum calls on the floor is being designed by Informatics, Inc. The design is scheduled for delivery to the clerk of the House by April 1.

Within about a month after that, contracts for the system will be let to hardware manufacturers. The system should be in and tested by year-end so that the second session of the 92d Congress will be able to use it, according to William Hartnett of the clerk's office. Hartnett is monitoring the design and implementation of the system.

Rep. Joe D. Waggoner Jr. (D-La.) and the Special Subcommittee on Electrical and Mechan-

ical Office Equipment have been instrumental in promoting the idea of such a system.

About 14 or 15 companies were interviewed by the clerk's office for system design, with Informatics getting the nod for about \$100,000. The bid was not the lowest, Hartnett said, adding that choice was based on indications that a company could do the job.

In the proposed system, as envisioned by the House, a member will be recorded on a vote or quorum call by inserting his personalized card (the size of a standard credit card) into any of 49 voting stations located throughout the House floor, and pressing one of three buttons — yea, nay or present.

The member's vote condition or presence will be stored in a computer for permanent record, available for retrieval at any time and will be displayed immediately in the chamber for his verification. A computer print-out will be available immediately following the vote.

Leasco Renews T/S Commitment

CW Midwest Bureau

CHICAGO — The president of Leasco has renewed his company's commitment to the time-sharing phase of the industry. A subsidiary, Leasco Response, announced plans to franchise remote computing in 40 cities.

"It will take time, superior service, and substantial commitments of resources to be successful in remote computing," said Frank H. McCracken, president of Leasco Data Processing Equipment Corp., [but] "Leasco intends to be one of those few companies that win in this market."

McCracken said Leasco was making a \$30 million commitment to T/S operations.

Leasco Response has also organized a data network division to franchise remote computing, said Robert Destephano, president.

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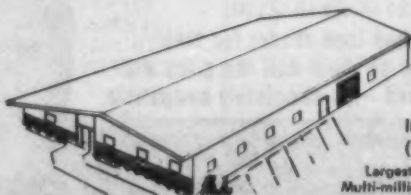
026 consists of - 300550 - 228450 - 312047 (Code Plate)

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CODE PLATES - 312047 \$24.00 in any quantity
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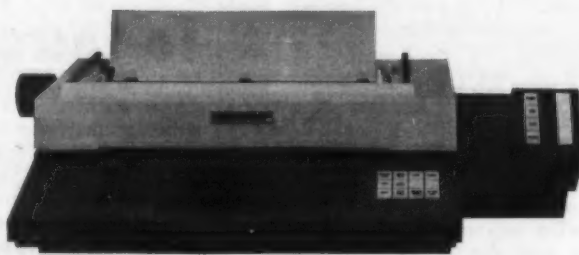


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GTE INFORMATION SYSTEMS

Digital Computer Enters 16-bit Field With D-216 MSI Mini

FAIRFIELD, N.J. — The 16-bit D-216 MSI minicomputer from Digital Computer Controls, Inc. is plug- and program-compatible with other 16-bit minis, and has a base price of \$2,600, according to the firm.

Memory options of read-only memory and random access memory are available in increments of 256, 1,024, or 4,096 words. The firm will provide central processor options and peripherals to meet expanded system requirements. Deliveries are scheduled to begin in August. Quantity discounts up to 28% are available from 23 Just Road.

Friden Offers Serial Printer, High-Speed Tape Reader

ROCHESTER, N.Y. — A medium-speed serial printer and a high-speed tape reader are available from the Singer Co.'s Friden Division.

The Friden Model HP-030 Serial Printer features an adjustable 13 to 132 character print line and full 63-character (plus space) alphanumeric printout. It is capable of synchronous or asynchronous operation up to 30 char/sec.

The Friden HP-030 Serial Printer is available as a mechanism only, with electronics and power supply, or with electronics, power supply and cabinet, and is individually priced at \$725. Quantity discounts are available.

The Friden RR-300 High Speed Reader is capable of asynchronous operation up to 120 char/sec and of synchronous operation up to 300 char/sec. Reader operation is bidirectional, and will stop at all speeds, on the last code read.

It features standard NAB hubs, and accommodates 8-in. or 10-1/2 in. reels of paper or mylar tape (5-, 6-, 7- or 8-channel). Tape in widths of 11/16 in., 7/8 in. and 1 in. may be used. The reader with reeling mechanism is priced at \$790, with quantity discounts available.

Auricord Provides Power Supply, Switching Assembly for Tape Deck

LONG ISLAND CITY, N.Y. — The PS-2 power supply and switching assembly from Auricord Division — Scovill was developed to provide the TR-1000 reel-to-reel tape deck with fast forward, fast rewind and pause capabilities. Automatic end-of-tape stop is also featured.

The unit price is \$57.50 from the firm at 35-41 29th St.

Signetics Offers 1,024-bit, 2,048-bit MOS Static Read-Only Memories

SUNNYVALE, Calif. — A family of 1,024-bit and 2,048-bit MOS read-only memory (ROM) integrated circuits is now available from Signetics for code conversion, microprogramming, panel displays and billboards, printer character generators, raster-scan CRT displays, and other applications.

Typical address time is 550 nsec, and power dissipation is approximately 150 mW.

There are three ROM series within the 2400 family. The 2410 series is essentially a 1,024-bit MOS ROM organized as 256 words of 4 bits in a 16-pin package. Devices in the 2420 series are 1,024-bit ROMs organized either as 128 words by 8 bits or as 256 words by 4 bits in a 24-pin package.

The ROMs in the 2430 series are 2,048-bit devices organized as 256 words of 8 bits or as 512 words of 4 bits, and the package has 24 pins. All are fully decoded.

The ROMs can be obtained with either of two kinds of output. One type employs pull-up resistors for driving other MOS devices, and the other type has a "bare drain" output without the resistors, allowing the ROMs to drive TTL and DTL devices directly while permitting external "wired AND" operation.

EM Offers Commercial Memory

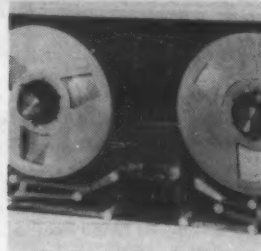
HAWTHORNE, Calif. — Electronic Memories has announced availability of the Micromemory 4000, priced at under 1.5 cent/bit for 100 units.

Basic module capacity is 32,768 words of 18 bit/word; access time is 800 nsec and cycle time is 1.5 nsec. Logic is

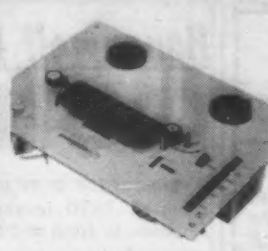
New OEM Products

provided for zoning the 18-bit word into two 9-bit bytes or for operating the system as 65,536 words of 9 bit/word with 16 single rail address lines.

Expansion is accomplished by bussing output of open collector TTL logic gates with internal decoding provided for up to eight modules. An additional memory select line allows external decoding for expansion beyond eight modules.



Friden Model RR-300



Auricord Power Supply



Fairchild 430 Punch

Paper Tape Punch Bidirectional

PLAINVIEW, N.Y. — The Fairchild Graphic Equipment Division is offering a synchronous, bidirectional perforated tape punch, called the Fairchild 430 Punch Mechanism. The unit operates at 50 char/sec and can punch 6, 7, or 8 levels on a 7/8 in. or 1 in. wide tape.

The 430 is UL approved, and has all permanently lubricated bearings. All sliding surfaces are coated with a dry film lubricant. The punch and die block has a life expectancy of 100 million characters, the firm said.

DTL and TTL compatible drive and

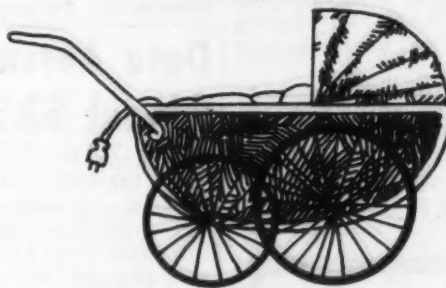
control electronics can be provided.

Fort FS-300 Codes at Keyboard

BEVERLY, Mass. — Fort Electronics Products, a division of Syner-Data, Inc., has designed a modular, solid-state keyboard which is said to eliminate all encoding electronics. The heart of the Fort FS-300 is a ferrite key switch, which develops the code by opening and closing a magnetic path.

The FS-300 Solid State Keyboard logic level outputs are DTL and TTL compatible. Standard Ascii, BCD, Ebcidic or PTS codes and special codes are available from the firm at 133 Brimball Ave.

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Nickels and Dimes

Recognition Equipment shareholders got the word they were waiting for at the recent annual meeting — the firm plans to make money in 1971 after expensing all research and development costs.

At the same time, the company received some good news, too — its lending banks agreed to extend an \$18 million loan commitment and GE Credit Corp. agreed to lend up to \$25 million for financing customer leases.

\$\$\$

It appears Ite will be getting its money's worth if the announced acquisition with Information Storage Systems goes through. ISS reported income of a little over \$3 million on sales of over \$24 million in 1970 — its first full year of operation — despite the poor economy.

\$\$\$

Corporation S is making every effort to support Optimization centers in such a way that it will achieve positive cash-flow positions by the end of fiscal 1971, stockholders were told recently.

\$\$\$

Ever want to buy Burroughs in Brussels, Belgium? Now it's possible since the Belgium stock exchange is the 13th exchange in the world to list the Burroughs stock.

Honeywell Equals '69

CDC, NCR Reports Show Earnings Decline

Three of the seven dwarfs have reported 1970 results and the Honeywell, NCR and CDC wrap-ups underline once again that 1970 was at best a sluggish year for almost everyone in the industry except IBM.

On the bright side, Honeywell was able to increase sales and reach earnings equal to those of 1969, but the other two were not so fortunate, with NCR reporting an earnings slide on increased revenues and Control Data showing a loss for the year.

Honeywell, which has restated its 1969 results to account for the GE merger, showed worldwide sales and service revenues up 5% to \$1.921 billion from a restated \$1.838 billion in 1969.

Earnings of \$62 million or \$3.58 per share compared with a restated \$62 million, \$3.76 a share, a year earlier.

Unaudited fourth quarter earnings were \$25.3 million, equal to \$1.46 per share on fourth quarter sales of \$511 million.

Earnings in 1970 were affected by the fact that the accounting system used by GE was conformed largely to the Honeywell basis as of Oct. 1, 1970, resulting in \$6.2 million of earnings or 36 cents per share.

Earnings were also affected by the fact that Yamatake-Honeywell, a 50% owned Japanese affiliate, was consolidated for the first time in 1970. This resulted in \$1.2 million of earnings

or 7 cents per share and an equal amount in 1969.

Honeywell also noted that pre-tax earnings of \$119 million were off from 1969's pre-tax level of \$131 million, mainly as a result of heavier interest

Financial

charges. After-tax earnings, however, were favorably affected by tax-loss carry forwards in Europe.

The computer business accounted for about 45% of Honeywell's total business in 1970, up from 42% restated for the previous year. Worldwide computer sales and rental revenues totaled \$861 million, up 13% from a restated total of \$763 million a year ago.

NCR Revenues Up

Worldwide revenues of the National Cash Register Co. reached a new high of \$1.42 billion in 1970, a 12% increase over the \$1.265 billion recorded in 1969. Consolidated net earnings after

taxes totaled \$30.2 million, compared with \$46.2 million in 1969, or a decline of 34%. This amounted to \$1.37 per share compared with \$2.11 per share in 1969 and reflects a two-for-one stock split last year.

During 1970 the company installed more computer equipment than in any previous year, including over 1,100 NCR Century Series, NCR claimed. Also in the field, 1970 was a record year for the company's network of 80 data centers which experienced a 24% increase in worldwide volume.

The consolidated net loss for

CDC in calendar year 1970 was estimated to be \$2.7 million, a loss of 30 cents per share. This compares with net earnings for 1969 of \$51.7 million or \$3.51 per share.

The estimated 1970 loss in the company's computer business was \$35.6 million. Net income of Commercial Credit Co. approximated \$38.2 million. Revenues of the computer business totaled approximately \$540 million in 1970 compared with \$570 million for 1969 which included \$39 million realized from the sale of lease rights. No lease rights were sold in 1970.

DEC Sees Earnings Drop

MAYNARD, Mass. — Even the mightiest minimaker is feeling the effects of the economic climate. Digital Equipment Corp. has finally seen earnings drop.

For the first six months DEC has reported profits of \$5.4 million on sales of \$68.5 million, compared to \$6.3 million in profits and \$60.9 million in sales last year. Per share income

dropped from 67 cents to 55 cents.

The company decided to continue its planned research and development program and expansion of sales and service organizations in spite of the general slowdown in the capital equipment market, noted President Kenneth H. Olsen.

During the past year, the company's sales force has increased from 300 to more than 400 salesmen and the service organization has grown from approximately 600 to about 800 field engineers, he said.

Research and development activity over the past six months has resulted in the introduction of a variety of new products. Chief among these are a low-cost line printer, several mass storage devices, a time-shared version of its PDP-11 and a computer-based terminal for PDP-10s.

Data Automation 6-Month Figures Reveal \$3.7 Million Total Loss

DALLAS — In the six months ended last July 31, Data Automation lost a bundle, and early this month it lost its president.

Operating losses for the period were \$560,000, and write-downs ballooned that figure to a \$3.7 million total loss for the half.

Company Chairman Loyse E. Caldwell has taken over the duties of James K. Devlin, former president and chief executive officer. Devlin remains a director and member of the executive committee.

In a report to shareholders the company said that current cash flow before debt service is not enough to cover operations. "Certain secured and unsecured creditors... have taken the position that the company is in default under its loan agreements," the report said.

While Data Automation is

moving to restructure its debt, there is no assurance that it will work, according to the report.

Cost-cutting efforts began in the third quarter, "but based on preliminary indications [Data Automation]... is still suffering from continuing losses and substantial cash flow deficits," the report noted.

EAI Posts First Profit Since '69

WEST LONG BRANCH, N.J. — Electronic Associates, Inc. (EAI) posted a profit for the last quarter, its first since the middle of 1969.

In the last period of the fiscal year ended Jan. 1, EAI recorded a net operating profit of \$78,000, or 3 cents a share, on sales of \$9.2 million.

For the fiscal year sales were \$31 million, net operating loss of \$5 million, or \$1.95 a share, and loss from extraordinary items of \$4 million, or \$1.56 a share, for a total loss of \$9 million, or \$3.51 a share.

The extraordinary items

stemmed from accounting changes and discontinued operations.

For the year ended Dec. 31, 1969, EAI lost \$2.2 million, or 86 cents a share, on sales of \$41.2 million.

The president of the maker of analog computers, E.A. Petko, noted that during the year EAI discontinued unprofitable product areas, established "tight financial and inventory controls," and cut personnel and facilities.

"Indications are that profitability can be achieved in 1971 on last year's sales levels," he noted.

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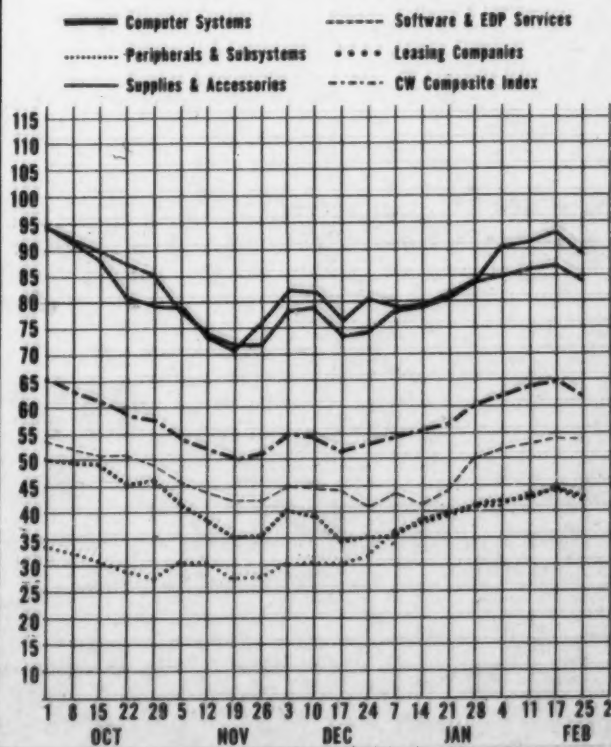
CLOSING PRICES THURSDAY, FEBRUARY 25, 1971

E X C H		PRICE			
		1970-71	CLOSE	WEEK	WEEK
		RANGE	FEB 25	NET	PCT
		(1)	1971	CHNGE	CHNGE
SOFTWARE & EDP SERVICES					
O	ADVANCED COMP TECH	1- 10	2 3/4	- 1/4	-8.3
A	APPLIED DATA RES.	4- 24	13	+2 3/4	+26.8
O	APPLIED LOGIC	1- 18	1 5/8	0	0.0
O	ARIES	1- 8	1 7/8	0	0.0
N	AUTOMATIC DATA PROC	23- 52	52	+2 5/8	+5.3
O	AUTO SCIENCES	3- 14	8	- 1/4	-3.0
O	BRANDON APPLIED SYS	1- 10	3/4	- 1/8	-14.2
O	COMPUTER AGE INDUS.	1- 3	3/4	0	0.0
O	COMPUTER ENVIRON	1- 15	1 1/4	- 1/8	-9.0
O	COMPUTER INDUS.	2- 24	5	0	0.0
O	COMPUTER NETWORK	2- 14	6	+ 1/2	+9.0
O	COMPUTER PROPERTY	4- 15	7	- 1/2	-6.6
N	COMPUTER SCIENCES	6- 34	12	- 7/8	-6.7
O	COMPUTER TASK GROUP	1- 4	3/4	- 1/4	-25.0
O	COMPUTER USAGE	2- 11	11 1/8	+4 3/8	+64.8
O	COMP AUTOMOT REPORTS	3- 11	6 3/8	- 1/8	-1.9
A	COMPUTING & SOFTWARE	16- 75	33	-1 5/8	-4.6
O	COMRESS	1- 10	2 3/4	+ 5/8	+29.4
O	COMSHARE	2- 15	4 3/4	- 1/4	-5.0
O	CONSOL. ANAL. CENT.	1- 4	1 1/2	- 1/8	-7.6
O	DATA AUTOMATION	1- 24	2	+ 1/2	+33.3
O	DATA PACKAGING	5- 29	8 1/8	- 5/8	-7.1
O	DATAMATION SERVICE	1- 6	1 1/2	0	0.0
O	DATATAB	4- 9	6 3/4	0	0.0
O	DIGITEK	1- 5	2 1/4	0	0.0
O	EDP RESOURCES	5- 13	9 3/8	- 1/4	-2.5
A	ELECT COMP PROG	3- 11	5	0	0.0
O	ELECTRONIC DATA SYS.	31-161	69	-5 1/2	-7.3
O	INFORMATICS	4- 21	9 5/8	- 1/4	-2.5
A	ITEL	6- 26	17 3/8	-1 1/8	-6.0
A	MANAGEMENT DATA	7- 25	10	+ 1/4	+2.5
O	NATIONAL CSS INC	4- 16	8 1/2	+ 1/4	+3.0
O	NAT COMP ANALYSTS	1- 8	1 1/2	0	0.0
O	NAT.COMP. SERV.	2- 12	2 7/8	- 1/8	-4.1
N	PLANNING RESEARCH	13- 54	21 3/4	-1	-4.3
O	PROGRAMMING METHODS	9- 29	25 1/2	-1	-3.7
O	PROGRAMMING & SYS	2- 5	3 1/8	- 3/8	-10.7
L	PROGRAMMING SCIENCES	1- 33	1 7/8	- 1/4	-11.7
O	SCIENTIFIC RESOURCES	1- 22	1	-3 3/8	-77.1
O	SOFTWARE SYSTEMS	1- 3	1 1/2	0	0.0
O	TBS COMPUTER CENTERS	4- 27	6	0	0.0
O	TOLLEY INTL CORP	1- 13	4 3/8	- 1/8	-2.7
O	UNITED DATA CENTER	1- 5	3 3/4	0	0.0
N	UNIVERSITY COMPUTING	14- 99	23 1/8	-1 7/8	-7.5
A	URS SYSTEMS	5- 21	9 3/4	- 5/8	-6.0
O	U.S. TIME SHARING	1- 14	1 3/4	- 1/8	-6.6
PERIPHERALS & SUBSYSTEMS					
N	ADDRESSOGRAPH-MULT	20- 62	30 3/8	- 5/8	-2.0
O	ALPHANUMERIC	2- 15	5 5/8	+ 1/2	+9.7
N	AMPEX CORP	13- 48	19 1/4	-1 1/4	-6.0
O	ASTRODATA	1- 34	1 5/8	+ 1/4	+18.1
O	ATLANTIC TECHNOLOGY	2- 14	4 7/8	0	0.0
A	BOLT, BERANEK & NEW	3- 11	7 1/4	0	0.0
N	BUNKER-RAND	6- 14	11 3/4	- 1/8	-1.0
A	CALCOMP	11- 36	25 7/8	-1 3/4	-6.3
O	COGNITRONICS	3- 13	8 1/4	+ 1/8	+1.5
O	COLORADO INSTRUMENTS	4- 12	6 3/8	-1 1/8	-15.0
O	COMPUTER COMMUN.	5- 36	11 1/8	-1 5/8	-12.7
A	COMPUTER EQUIPMENT	4- 12	5 1/4	- 5/8	-10.6
A	COMPUTEST	12- 28	17 5/8	- 3/4	-4.0
O	CONSOL COMPUTER LTD.	4- 14	10 3/4	+ 1/4	+2.3
A	DATA PRODUCTS CORP	5- 26	7 5/8	- 3/8	-4.6
O	DATA TECHNOLOGY	2- 23	5 3/4	-1 1/8	-16.3
O	DIGITRONICS	3- 13	6 3/4	-1 1/8	-14.2
N	ELECTRONIC M & M	7- 40	10 1/4	- 3/8	-3.5
O	FABRI-TEK	2- 8	2 7/8	0	0.0
O	FARRINGTON MFG	1- 17	1 1/2	- 1/8	-7.6
O	FOTO-MEM INC	2- 39	2 3/4	+ 1/4	+10.0
O	INFOTEX INC	16- 39	32 1/2	- 3/4	-2.2
O	INFORMATION DISPLAYS	4- 20	6 1/8	- 1/4	-3.9
O	KEYDATA CORP	7- 14	12 1/8	- 3/4	-5.8
O	MANAGEMENT ASSIST	1- 4	7/8	- 3/8	-30.0
A	MARSHALL INDUSTRIES	14- 67	20 7/8	-1 3/8	-6.1
A	MILGO ELECTRONICS	15- 42	18 1/4	-2 1/8	-10.4
N	MOHAWK DATA SCI	19- 87	30	- 1/4	-0.8
O	OH LINE SYSTEMS INC	6- 23	10 1/2	- 1/2	-4.5
O	OPTICAL SCANNING	11- 52	16 3/4	-1 1/4	-6.9
O	PHOTON	4- 17	10 1/8	+ 7/8	+9.4
O	PHOTO-MAGNETIC SYS.	1- 6	1 3/4	+ 1/4	+16.6
A	POTTER INSTRUMENT	15- 42	20 5/8	- 1/2	-2.3
O	PRECISION INST.	6- 25	10	-1	-9.0
O	RECOGNITION EQUIP	12- 83	21 3/8	+ 1/4	+1.1
O	REDCOR CORP.	4- 34	6 3/8	- 7/8	-12.0
N	SANDERS ASSOCIATES	7- 29	17 3/8	- 1/2	-2.7
O	SCAN DATA	5- 53	7 7/8	- 7/8	-10.0
O	TALLY CORP.	10- 23	13 3/8	- 3/8	-2.7
N	TELEX	10- 25	16 1/4	- 1/4	-1.5
O	VIATRON	1- 51	1 1/4	-1 1/4	-50.0
SUPPLIES & ACCESSORIES					
N	ADAMS-MILLIS CORP	8- 19	17 1/4	-1 5/8	-8.6
O	BALTIMORE BUS FORMS	6- 21	9 1/2	- 3/4	-7.3
A	BARRY WRIGHT	6- 25	10 7/8	-1 1/8	-9.3
A	DATA DOCUMENTS	15- 35	27 5/8	+ 5/8	+2.3
N	ENNIS BUS. FORMS	9- 19	11 3/4	-1	-7.8
O	GRAHAM MAGNETICS	4- 16	15 3/4	+1 7/8	+13.5
O	GRAPHIC CONTROLS	5- 17	7 3/4	- 7/8	-10.1
N	MEMOREX	46-166	57 3/4	+ 1/2	+0.8
N	3M COMPANY	71-114	102 1/2	-1 3/8	-1.3

E X C H		PRICE			
		1970-71 RANGE (1)	CLOSE FEB 25 1971	WEEK NET CHNGE	WEEK PCT CHNGE
O	MOORE BUS. FORMS	25- 39	37 3/4	- 5/8	-1.6
N	NASHUA CORP	21- 43	36	-1	-2.7
O	REYNOLDS & REYNOLD	25- 48	43	+1 1/4	+2.9
O	STANDARD REGISTER	17- 30	21 3/8	+ 1/4	+1.1
O	TAB PRODUCTS CO	4- 12	11 3/4	+ 1/8	+1.0
N	UARCO	22- 39	26 5/8	- 5/8	-2.2
A	WABASH MAGNETICS	7- 30	9	-1 1/4	-12.1
N	WALLACE BUS FORMS	17- 41	19 3/8	-1 1/8	-5.4
COMPUTER SYSTEMS					
N	BURROUGHS CORP	78-173	108 3/4	-14 3/8	-11.6
N	COLLINS RADIO	9- 37	16 1/4	-1 3/4	-9.7
N	CONTROL DATA CORP	30-122	58	-3	-4.9
O	DATA GENERAL CORP	16- 59	29	+2 5/8	+9.9
N	DIGITAL EQUIPMENT	50-124	68	-3	-4.2
N	ELECTRONIC ASSOC.	3- 11	6 3/4	- 1/2	-6.8
A	ELECTRONIC ENGINEER.	3- 14	7	- 3/4	-9.6
N	FOXBORO	18- 39	35	+2 3/8	+7.2
O	GENERAL AUTOMATION	9- 42	19	+3 1/4	+20.6
N	GENERAL ELECTRIC	60-108	108 1/8	+4 1/8	+3.9
N	HEWLETT-PACKARD CO	19- 45	35 7/8	- 3/4	-2.0
N	HONEYWELL INC	65-152	99 1/2	-3	-2.9
N	IBM	223-387	334	-2 1/2	-0.7
O	INTERDATA INC	3- 22	7 3/8	- 1/2	-6.3
N	NCR	30- 86	39 3/8	-1	-2.4
N	RCA	18- 34	31 3/8	-1 3/8	-4.1
N	RAYTHEON CO	16- 37	35	-1 3/8	-3.7
O	SCI. CONTROL CORP.	1- 8	1 5/8	- 3/8	-18.7
N	SPERRY RAND	19- 40	31 7/8	+ 1/4	+0.7
A	SYSTEMS ENG. LABS	10- 49	14 3/8	- 3/4	-4.9
N	VARIAN ASSOCIATES	9- 29	16 1/4	-1 1/2	-8.4
N	WANG LABS.	18- 51	32 3/4	-1 7/8	-5.4
N	XEROX CORP	66-115	95	+ 5/8	+0.6
LEASING COMPANIES					
O	BOOTHE COMPUTER	8- 25	17	- 7/8	-4.8
O	BRESNAHAN COMP.	2- 9	3 3/4	- 1/8	-3.2
O	COMPUTER EXCHANGE	2- 9	5 1/4	-3 1/8	-37.3
A	COMPUTER INVSTRS GRP	4- 12	10 1/2	0	0.0
IN	DATA PROC. F & G	6- 32	14	0	0.0
O	DATRONIC RENTAL	2- 8	3 1/8	- 5/8	-16.6
A	DEARBORN COMPUTER	10- 30	28 1/4	- 7/8	-3.0
O	DIEROLD COMP. LEAS.	2- 8	6 7/8	- 1/8	-1.7
A	DPA, INC.	3- 10	5 3/4	- 1/2	-8.0
A	GRANITE MGT	7- 22	10 5/8	-1 1/2	-12.3
A	GREYHOUND COMPUTER	5- 44	9 1/2	+ 1/8	+1.3
N	LEASCO DATA PROC.	7- 30	18 3/4	-1 5/8	-7.9
O	LECTRO MGT INC	1- 9	2 5/8	+ 1/8	+5.0
A	LEVIN-TOWNSEND CMP	3- 19	5 1/2	- 1/2	-8.3
O	LMC DATA, INC.	1- 4	1	0	0.0
O	NCC INDUSTRIES	3- 8	5	0	0.0
O	SYSTEMS CAPITAL	1- 8	4 7/8	- 1/2	-9.3
N	U.S. LEASING	3- 20	17 3/4	- 5/8	-3.3

EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE
L=NATIONAL EXCHANGE; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Computer Stocks Trading Index



Earnings Reports

BOLT, BERANEK & NEWMAN Three Months Ended Dec. 31			
	1970	1969	
Shr Ernd	\$0.06	\$0.08	
Revenue	4,734,000	4,548,000	
Spec Chg	.....	b31,000	
Earnings	75,000	c70,000	
6 Mo Shr	.10	.18	
Revenue	9,162,000	9,118,000	
Spec Chg	.....	b31,000	
Earnings	125,000	c186,000	
a-Based on income before special charge. b-Represents net extraordinary loss in connection with eminent domain proceedings. c-Equal to 5 cents a share in the three months, and 15 cents a share in the six months.			
VARIAN ASSOCIATES Three Months Ended Jan. 1			
	1971	a1970	
Shr Ernd	\$0.01	\$0.18	
Revenue	46,021,000	46,487,000	
Spec Chg	c1,700,000	.....
Earnings	(Loss) (1,628,000)	1,274,000	
a-Restated to include results of Pulse Engineering Inc. b-Based on income before special charge. c-From relocation and consolidation of certain facilities.			
DOCUTEL CO. Year Ended Oct. 31			
	1970	1969	
Revenue	\$1,154,184	a.....	
Loss	3,072,169	\$784,953	
a-Not available as first production occurred in January 1970. Effective this year, the fiscal year will end Dec. 31.			
BANISTER CONTINENTAL CORP. Three Months Ended Dec. 31			
	1970	1969	
Shr Ernd	\$0.10	\$0.03	
Revenue	5,657,000	5,415,000	
Earnings	268,000	85,000	
9 Mo Shr	.16	.31	
Revenue	15,813,000	20,121,000	
Earnings	434,000	737,000	
COMPUTER COMMUNICATIONS Six Months Ended Dec. 31			
	1970	1969	
aShr Ernd	.....	\$0.21	
Revenue	\$2,635,612	4,585,845	
Earnings	(Loss) (b770,607)	251,066	
a-Based on common and common equivalent shares. b-Includes write-off of \$200,000 of assets from discontinued aerospace division, and that division's net operating loss during the period of \$74,393.			
TELEX CORP. Nine Months Ended Dec. 31			
	1970	1969	
Shr Ernd	\$0.48	\$0.38	
Revenue	57,219,000	39,544,000	
Earnings	5,050,000	3,905,000	
a-Adjusted to reflect five-for-one stock split in May 1970.			
DATA PRODUCTS CORP. Nine Months Ended Dec. 24			
	1970	1969	
Shr Ernd	.....	\$0.18	
Revenue	\$31,505,000	31,614,000	
Spec Cred	.....	b231,000	
Earnings	(Loss) (8,898,000)	c1,406,000	
a-Based on income before special credit. b-Consists of a tax credit and gain from sale of a building. c-Equal to 22 cents a share.			
COMPUTER SCIENCES CORP. Three Months Ended Dec. 25			
	1970	a1969	
Shr Ernd	\$0.09	\$0.22	
Revenue	30,217,000	25,836,000	
Earnings	1,125,000	2,823,000	
9 Mo Shr	.29	.67	
Revenue	83,005,000	74,699,000	
Earnings	3,649,000	8,521,000	
a-Restated to include acquisition on a pooling-of-interest basis.			

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